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AGRICULTURAL JOURNAL, AND TRANSACTIONS

OF THE

Lower Canada Agricultural Society.

Biological
& Medical

VOL. 2.

MONTREAL, JANUARY, 1850.

NO. 1.

The Quarterly Meeting of the Directors of the Lower Canada Agricultural Society took place at their Rooms, in this city, on Saturday, the 15th December last, pursuant to notice, published in both the English and French Agricultural Journals, and letters addressed to the members of the Society. Members present:—John Yule, Esq., President of the Society; Honorable R. S. De Beaujeu, Major Campbell, the Rev. Mr. Desaulniers, (St. Hyacinthe College,) P. E. Leclere, Alfred Pinsonnault, Alfred Turgeon, Alex. Morris, Hector L. Langevin, Esquires, Dr. Polin, M. D., and the Secretary, Wm. Evans.

The President having taken the chair, the Secretary submitted a number of letters received since the last meeting—all recommending the Journal to be continued. Several other letters were also received from Directors who were unable to attend, to the same effect. A complete statement of the subscriptions due to the Society for the Journal was laid before the Directors, showing a very large amount due. The Secretary stated that he sent statements of the subscriptions due to the several agents appointed in the different parishes, requesting them to endeavor to collect them. Several Resolutions were proposed and adopted. One of them, that the Agricultural Journal should continue to be published by the Society for the year 1850. In consequence of the absence from the Province of the Hon. Adam Ferrie, and the non-attendance of the Hon. J. Molson, two members of the Finance Committee, it was proposed

that the Hon. A. N. Morin, and Major Campbell, be elected instead of the two first named gentlemen, as members of the Finance Committee, which was carried unanimously. Two more Committees were appointed for other purposes. The meeting resolved that the most prompt measures should be adopted to collect the subscriptions remaining due, and that the several agents appointed for the Agricultural Journal should be urged to collect what is due in their several parishes, and requested to make correct returns of the actual subscribers to the Journal, as soon as possible, to the Secretary. The meeting then separated.

By order,

WM. EVANS,
Secretary L. C. A. S.

The Agricultural Journal has been continued by the Lower Canada Agricultural Society, in consequence of the numerous recommendations to do so, and the promises of support received from all sections of Eastern Canada: and we hope the Society will not be disappointed in receiving this support, as they publish the Journal with no other view than to promote agricultural improvement, and the general prosperity of the country. It will not be very creditable to this section of the Province, if the expenses of the publication are not fully re-imbursed to the Society. We suppose there are not less than 100,000 farmers, and other parties directly interested in land, in Lower Canada, and if so, it would not require more than one penny from each to

pay every expense of publishing between three and four thousand of the Journal annually for distribution. This amount could scarcely be felt as a sacrifice by the poorest farmer in Canada. If only 2000 farmers were to subscribe (out of the vast number) one dollar annually it would support the Journal, and enable the Society to distribute gratuitously, 1000 copies to country schools and in any other way that might be thought expedient. If this appeal to the agricultural population and their friends is not responded to, there is little hope of being able to effect much good by the Journal, however well it may be got up. The farmer who would not contribute five shillings annually to such an object, whether he might benefit by it or not, cannot feel much interest in the general improvement of Canadian agriculture; indeed we very much doubt whether he would desire to improve his own system of husbandry, but would rather practice a defective system, than introduce an improvement at any other's suggestion than his own. To any other class than the agricultural, it would appear an absurdity, if they were to forego the advantage of subscribing to a Journal that would contain much useful information referring to their business or profession at the small sum of five shillings annually. We know perfectly well, that much of what is termed "Book Farming" is worthless, and only calculated to lead inexperienced farmers into error—but we are equally certain that much good may be derived from the perusal of agricultural works, and that the best instructed farmers are the most likely to perceive these advantages and profit by them—chiefly because they are able to appreciate at once, any suggestions or information, which they know by their experience to be reasonable, and entitled to a fair trial. If only one farmer in a parish will have the good sense to do this, it will lead others to inquiry and experiment, and thus improvement would probably extend where most required. We have great hopes from the

interest manifested by the clergy for the publication of this Journal, that through their support and recommendation to their parishioners, a large amount of good will be effected. So long as we are connected with the Journal, we trust not one sentence will be inserted in its columns, that would prevent the support of this most respectable class of the community. We shall be equally careful to avoid all party or political questions. Our aim shall be to recommend Agriculture in the strongest terms we can employ, as the chief basis of all the wealth and prosperity this country can attain to, and therefore that it should be improved to the uttermost it is capable of, by every possible means. To effect this improvement we shall submit our own humble suggestions, and collect all the useful information in our power from every source at our disposal. If we are not able by this means, and the assistance of our Correspondents, to make a Journal of nearly 400 pages, worth five shillings annually to any man engaged or interested in Agriculture, we shall be very little satisfied with our fitness to act in the capacity of Editor to it. We now appeal to all who approve to give the most satisfactory proof of their approbation by subscribing to the Journal for this year. This will be the unmistakable standard by which to ascertain the estimation in which the Journal is held by all who take it or read it. We certainly cannot flatter ourselves that it will be estimated very highly, if much more than a sufficient number of paying subscribers will not be found to support it, and not allow the Society to suffer one shilling loss in its publication. It is very disagreeable to us to occupy so much space on this subject, but what is the advantage of publishing this periodical, at a considerable expense, if those proposed to be benefited by it, will not think it worth paying the small amount of five shillings annually for it. We expect not to have occasion again to write one sentence on this subject, but on the contrary, to have the satisfaction of thankfully acknowledging the favour.

and ample support it has received, which will be to us a much more pleasing duty.

We perceive by our exchange papers, that it is expected Professor Johnson, (who we believe is now in New Brunswick,) will deliver Lectures on Agriculture at Albany, in the present month of January. We admire the persevering energy of the farmers of the United States, in making arrangements to procure the advantage of hearing the able lectures of this talented gentleman, on subjects connected with agriculture. We do not say we envy our brother farmers of the States for this privilege, but it is to be regretted there are not the same advantages for Canadian farmers. In all countries where the improvement of agriculture is desired, every exertion is made to forward this improvement. A few thousand pounds should not be withheld for a moment, if it could be advantageously employed to promote the improvement of Canadian Agriculture. It would soon be repaid to the country a thousand fold. Only let it be satisfactorily proved, that such outlay would be likely to effect this object, and they are no friends to Canada who would not recommend such expenditure.

In Scotland, they occasionally adopt the plan of covering the backs of the sheep with a cloth at the commencement of winter, which we have no doubt answers a good purpose, and we believe the same plan might be introduced here to great advantage. It would keep off the snow from settling down in the wool of the sheep, and freezing there, very much to their injury. We give a description of the size of the cloth made use of, and the mode of attaching it to the sheep, copied from the *Irish Farmers' Gazette*.

We have no doubt that the use of a cloth put on the backs of sheep here, particularly breeding ewes, would preserve them from much cold and suffering. The trouble and expense

may be objected to, but we think both would be compensated amply to the farmer who would take this trouble to provide for the comfort of his sheep. In the Old Country they very commonly make use of a sort of ointment, applied liberally to the back and sides of the sheep. It is found to increase the growth of wool—throw off the wet, and be every way beneficial. Care must be taken, however, not to put any substance in the ointment that would discolour the wool, or be injurious to the health of the sheep.

We have received two communications from a Correspondent, over the signature T., for which we beg to return thanks. Such communications on various subjects connected with agriculture, would greatly increase the usefulness of this Journal, and we should be very much gratified to give other opinions on these subjects as well as our own. The letter on draining contains valuable information respecting the use of small poles and other wood in under draining. We have frequently recommended the use of these materials, where stone or tiles cannot be had, or costs too much. We are glad to be able to submit our correspondents' letter, to prove that wood may be employed in under draining with the best prospect of success, and the expense cannot be very great. There is no doubt that the plan of draining adopted by our correspondent must succeed, wherever it is tried, and the work executed properly. His communication respecting Agricultural Societies, deserves attention. When acting as the Secretary of the Montreal District Agricultural Society, it was a rule that no Member of the Committee of Directors should receive any pecuniary reward as premiums, except the Silver Medal of the Society, and this rule was adopted, and there was a considerable number of medals imported from England. We conceive that this rule should be general with all Societies who obtain aid by public grants from the Legislature. No farmer should

become a director for the distribution of public money, unless he is satisfied to forego any participation in the distribution to himself.

CORRESPONDENCE.

To the Secretary of the Lower Canadian Agricultural Society.

SIR,—I cannot but join my feeble voice in the general expression of approval, of the useful Society to which you act as Secretary, as well as to your own personal zeal and industry, and to regret that your labours should have proved so unproductive as to make it a question whether the Journal should be continued or suppressed. I am not aware of the amount of loss incurred by its continuance, but hope that, having proposed the plan of an agency in every parish, every friend to agricultural improvement will, without delay, take advantage of the opportunity, and select some person who will willingly and freely assist in carrying out your truly patriotic exertions. I herewith send you the name and address of one, who, I believe, will, zealously do his best in the parish in which we reside; and should other locations do the same, perhaps their united endeavours may serve the Journal until better times shall arrive, when it will not only take care of itself, but make such returns to its generous projectors as will enable them to make it more generally popular, by adopting the measures you have already proposed, of enriching it with maps, and plans, and delineations, which, however expensive, are by far the most effectual way of communicating the knowledge of machinery, of implements, and much other work to be done about a farm. I am aware that you are far better acquainted with the subjects most popular and useful for delineation than I can possibly be; nevertheless, I do beg leave to observe, that besides farm implements and machinery, that the first principles of carpentry would be greatly beneficial, if diffused through the rural population, by cuts, shewing proportions and strength of material, added to the method of framing and putting together with economy and solidity. The poorer farm cottages in the country parts are sadly deficient in this respect;

the ponderous construction of a sightless habitation, as now put up, inconvenient and untidy, costs more labour and expense than a comfortable, well proportioned, neat, and happy looking dwelling; and, if not too expensive, the drafts of some model cottages and out-buildings might occupy a part of the Journal, which would not only improve our tastes, but might excite our emulation.

That the Society have reason to be dissatisfied with the apathy of the Agricultural Societies, in relation to your Journal, I have no reason to doubt; but it must be remembered that the persons, under whose ostensible direction they are placed, are, themselves, really subject to popular sway—that every two years their administration totally ceases—and that, therefore, the measures they are constrained to adopt are more frequently those of the popular voice, than those of their own reflective judgment—that even the measures for providing for the establishment of Model Farms, however desirable, are beyond their control; any immediate retention of the moneys actually received would be looked upon with suspicion, and the committee that would attempt to carry out such distant prospects of usefulness, to be derived from the withholding of the expected premiums, would soon be removed, in order to make way for others of a more distributive complexion. This, however, might be easily remedied by a Legislative enactment, but not easily accomplished by the Societies themselves.

I acknowledge myself indebted to your correspondent of the County of Quebec, whose communication is contained in your last monthly number, shewing forth seeming abuses, inseparable from the system, which strangely enough he does not appear to condemn in the individual, but in the aggregate. As the law now stands, all the Managers, Presidents, Treasurers, Secretaries, and Committee-men, are allowed to enter into competition for the premiums in perfect equality with the public, whereas they do possess advantages which the public do not, which might be used unfairly to their own particular gain, but which, whether or not so used, expose them to suspicion, and create discontent. Now, this might easily be obviated, by simply enacting, that the mem-

bers of the Committee of Management, for the time being, should be allowed no other than honorary premiums or rewards, either directly or indirectly. Such a clause would, I think, greatly benefit the Agricultural Societies, by keeping out the suspected interested individuals, which your correspondent threatens "to steer his course, to render conspicuously notorious;" and indeed the Agricultural Societies would be very thankful to him if he would, as soon as convenient, carry his threat into execution. I am of opinion that they would shew a great amount of usefulness performed—that their failing to realize the full measure of anticipated success has not been the consequence of their want of energy or of honesty; neither is it to be attributed wholly to the defects in the statute, but in reality arises out of the novelty of the case, the unprepared situation of the country, and agriculturists generally—that their success depends mainly on the education of the rural population—that, at the same time, that they are greatly influential in promoting a general desire for instruction, they feel a well grounded confidence that their usefulness will increase in a duplicate ratio, in proportion with the advances made in education. Sir, your own well-founded complaints are a convincing proof of the difficulties that surround Agricultural Societies. It is true, as you very properly observe, that it is unaccountable that the people should be so alive, and so energetic, on subjects which only remotely concern them, and, at the same time, so perfectly calm and indifferent about those by which they live and provide for their families, for, when a political meeting is called, crowds assemble, and the numbers overflow—every man comes with his opinion formed and reflected on—his reasons ready. But when agricultural improvement is the question, it is a difficult matter even to form a quorum, and nobody appears to have given a thought about the business for which they are assembled. Measures are therefore hurriedly adopted, without sufficient previous examination; and those very individuals, whose duty it was to weigh and suggest better ones, are the very first to complain and expose the unsuccessful issue. But, Sir, a very short time will change all this—our necessities will compel us to change it—and

Agricultural Societies and Agriculture must flourish.

I am, Sir,

Your obedient humble servant,

T.

14th December, 1849.

To the Secretary of the Lower Canada Agricultural Society.

SIR,—As a practical farmer, I cannot too strongly recommend your views of draining the land, previous to wasting our substance in endeavouring to ameliorate the soil.

You have already treated the subject too well to render it necessary for me to enter more particularly upon the matter, but, in one instance, I beg leave to lay before you the result of my own experience, which I do not remember to have seen noticed, although eminently useful in this country where wood abounds. I have several acres, made twenty-five years ago, which remain still with undiminished utility. I constructed it thus—first, I dug my ditch four feet deep and two feet wide at bottom: I then laid two cedar poles, parallel, at the bottom of the ditch, leaving an interstice of about four inches between them: I continued to lay similar poles, end to end, the whole length: I then cross-cut a clean (that is without knots) and sound hemlock tree, of about eighteen inches diameter, into lengths of eighteen inches, which I split, with the greatest facility, into thicknesses of about three-quarters of an inch, and these I laid on my cedar poles at the bottom of my ditch, taking care to lap them over about an inch as I proceeded: I then threw in green branches and sticks, and then the matted turf, and filled up and levelled.

This method is so simple and plain—so economical, the material lying on almost every farm, no tiles, no leaking, no outlay wanting, except the labour, and withal, so effectual—that I am, perhaps, only telling what everybody knows, but few practice.

I am, Sir,

Your obedient humble servant,

T.

POINTE A CAVAGNOL, VAUDREUIL,
17th December, 1849.

SIR,—It will give me the greatest pleasure to forward your views, by every means in my power, in this parish, in relation to the Agricultural Journal, or to be in any other way instrumental in promoting the interests of Agriculture generally, under the guidance and instruction of your Society.

I feel it, however, incumbent on me to say that the almost entire absence of lettered instruction in this neighbourhood holds out but a poor prospect of increasing your subscription list for some years to come, besides, that agriculture forms no part of the elementary system at present generally practiced in country schools; nevertheless, your suggestion, in reference to this subject, if carried out, might produce unforeseen results, and with that hope, I beg leave to be

Your most obedient servant, &c.,

R. J. ROBINS,
Secretary V. A. S.

To the Secretary of the
Lower Canada Agricultural Society,
Montreal.

REVIEW.

EXPERIMENTAL AGRICULTURE; being the result of Past and Suggestions for Future Experiments, in Scientific and Practical Agriculture. By JAMES F. W. JOHNSTON, F.R.S.S.I. and E., &c. [Blackwood & Sons, Edinburgh. Octavo (pp. 265).

Chemistry has long been offering her services to agriculture. It is about half a century since Feureroy, a French chemist, wrote a large work on vegetation, which afterwards appeared in an English dress. Chemical science was then, compared with what it is now, only in its infancy; but its progress has been rapid towards maturity. Sir Humphrey Davy's "Agricultural Chemistry," and "Sinclair" on Grasses, two popular works, pointed out to the agriculturists of Great Britain the vast importance which a knowledge of chemistry would confer on the science of agriculture. So deep an impression had this made on the minds of many of our leading North British farmers, that it resulted in a chemical association in connection with agriculture being formed in Edinburgh, of which a great number of spirited farmers throughout Scotland became members. This association was fortunate in securing, for five years, the

services of the eminent author of the valuable work now before us, containing as it does, the results of his past experience, and the requisite means for the right conducting of experiments in agriculture. With the history and success of the association our readers are, we doubt not, already acquainted; and we now proceed to introduce to their acquaintanceship a work which contains a vast store of useful information, and subjects for thought, in a condensed form. The first part treats very minutely "of the knowledge required by a suggestor and maker of experiments; and of the way in which experiments ought to be made and criticised." We might be in danger of startling our readers were we even to give an abridgment out the multifarious requisites necessary for guiding the agricultural experimenter. They consist chiefly of a knowledge of the substances of which plants consist; of their functions and forms of chemical combination; composition of soils; nature of manures; of the varieties of feeding animals, and the structure of their digestive organs, but, for our encouragement, the author informs us that, "in the maker of the experiments all this knowledge is not required, although he cannot possess too much of it." He gives a brief summary of the substances of which the plant consists—"Carbon, Hydrogen, Oxygen, and Nitrogen." Of these four substances the nitrogen appears to be drawn by plants almost exclusively from the soil. The hydrogen and oxygen are drawn partly from the soil, and partly from the air, chiefly in the form of water, consists of these two elementary substances. "The mineral part of the plant, which forms from half a per cent. to 15 or even 20 per cent. of the whole weight of the dried plant, consists of from eight to twelve different substances. These are potash soda, lime, magnesia, oxide of iron, oxide of manganese, alumina, chlorine, sulphuric acid, phosphoric acid, silica, and probably fluorine."—(p. 8.) Referring our readers to the work itself for information regarding the "functions performed in plants by their organic, or mineral constituents," we shall merely give a short extract on silica, which we are told "exists in the sap in a soluble form, and deposits itself chiefly in the exterior portions of the stems and leaves of plants. It is supposed there to serve as a defence to the plant against external injury, and to give strength to the stem in the case of the grasses and corn-yielding plants; but, "our author adds, with that modesty which always characterises true genius, "what chemical functions it performs, if any, in directly promoting vegetable growth, we can scarcely as yet venture even to guess."—(p. 11.) We know of some plants the *Equisetum Hyemale*, for instance, which are used for polishing wood and metal, from the abundance of silica they contain. The one named is brought hither from Holland for

that purpose, under the name of Dutch rushes. Where silica is wanting, such as in mossy soils, cereal crops are apt to lodge, but the stem is strengthened by a mixture of silicious sand in the mossy soil.

We recently called the attention of our readers to the importance of a knowledge of meteorology as connected with agriculture; in this we observe we are supported by the talented author of the work under notice, who very justly observes, that "the variations of heat and cold, and of dryness and moisture, affect especially the gross produce of grass, oats, potatoes, and some other green crops, and the relative proportions of grain and straw in our corn crops."—(p. 70.)

The first part of the work concludes with an encouraging account of results obtained by Mr. Fleming of Barrochan, "as showing how much crops may be increased at a cheap rate by the careful experimenter." We intend returning to the consideration of the second part of this work, which gives accounts of "experiments with saline substances applied alone, and with lime, clay, and other mineral substances," containing much interesting information. In the meantime, we recommend the perusal of the work itself to our intelligent agricultural readers.—*North British Agriculturist*.

PLACING PIPE TILES IN DRAINS.

(To the Editor of the *North British Agriculturist*.)

SIR,—In your very useful publication of the 10th October, you have given extracts from the evidence of Robert Neilson, Esq., before the Court of the House of Lords on the subject of "land draining."

I observe that Mr. Neilson very properly objects to draining with small pipes, for the reason, that unless they are laid in collars, or very carefully placed in the clay, a small pipe is very apt to get out of place, and thereby effectually stop the drain.

I have myself experienced this difficulty; and having also had to contend with dishonest workmen, who wilfully displaced the pipes at the moment of packing, I was led to contrive a method of rendering this displacement impossible. I have ever since continued to use, in the South of England, the following simple but effectual plan:—

Take a straight, round rod, of dry ash, seven feet in length, reduce it in diameter until the pipes you are using will thread on to it, except the last nine inches, which must be left stouter. It will be found necessary to reduce the rod to a less diameter than the bore of the pipe, as many pipes are not quite straight.

Next take a bent scythe handle, and, to the lower end of it, fasten on a circular sheet-iron

socket, nine inches in length, and terminating in an eye, to take a hook, the socket to be of the diameter of the short end of the rod, set it at right-angles to the scythe handle, and pointing from its convex bend. Through this iron socket or tube, and inwards, in the direction of the bent handle, pass the ash rod, the stout end of which will join it firmly, and prevent its passing quite through; the scythe handle will then be in the position of bending over the rod.

On the rod so fixed thread six pipes, when three inches of the rod will remain uncovered; lower the whole into the drain by means of the bent handle, passing the three inches of uncovered rod into the last pipe laid in the drain. Leave the six pipes and the machine as they are in the bottom of the drain, and pack them down firmly with the material excavated from the drain, even to ramming or treading it in, for it is impossible to displace the pipes by so doing.

Having packed them tightly withdraw the machine by means of a long cord previously hooked to the eye in the socket, standing at some distance up the drain; thread on six more tiles and proceed as before.

If there should be such a bend in the drain as to prevent the use of the rod, an old tarred rope of the requisite diameter will answer the purpose, if the drain is wide enough for a man to get into, but it is necessarily more tedious.

I take this opportunity of adding my humble testimony to the necessity of deep draining, either in farming or engineering operations, if intended to be either permanent or economical.—I am, Sir, &c.

WILLIAM McADAM.

Bath, 5th November, 1849.

EXPERIMENTS UPON SOWING WHEAT.

TO THE EDITOR OF THE ESSEX HERALD.

SIR,—Having produced some experiments at our annual meeting upon sowing wheat, perhaps a few remarks in explanation will prove acceptable to those who feel interested in the results, much care and great pains having been taken to render them accurate.

The land selected for the trial is a mixed soil, deep staple resting upon marl, after a good plant of clover summer fed, and in good cultivation, and was planted on the 7th Nov., when it was wet and rather unfavourable for dibbling; and the rain which succeeded operated much against the experiments, as numbers of holes failed entirely, besides the loss of a great portion of seed which could not be detected; nevertheless the results are in unison and tolerably conclusive, and agree with a previous experiment.

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socket, nine inches in length, and terminating in an eye, to take a hook, the socket to be of the diameter of the short end of the rod, set it at right-angles to the scythe handle, and pointing from its convex bend. Through this iron socket or tube, and inwards, in the direction of the bent handle, pass the ash rod, the stout end of which will join it firmly, and prevent its passing quite through; the scythe handle will then be in the position of bending over the rod.

On the rod so fixed thread six pipes, when three inches of the rod will remain uncovered; lower the whole into the drain by means of the bent handle, passing the three inches of uncovered rod into the last pipe laid in the drain. Leave the six pipes and the machine as they are in the bottom of the drain, and pack them down firmly with the material excavated from the drain, even to ramming or treading it in, for it is impossible to displace the pipes by so doing.

Having packed them tightly withdraw the machine by means of a long cord previously hooked to the eye in the socket, standing at some distance up the drain; thread on six more tiles and proceed as before.

If there should be such a bend in the drain as to prevent the use of the rod, an old tarred rope of the requisite diameter will answer the purpose, if the drain is wide enough for a man to get into, but it is necessarily more tedious.

I take this opportunity of adding my humble testimony to the necessity of deep draining, either in farming or engineering operations, if intended to be either permanent or economical.—I am, Sir, &c.

WILLIAM M'ADAM.

Bath, 5th November, 1849.

EXPERIMENTS UPON SOWING WHEAT.

TO THE EDITOR OF THE ESSEX HERALD.

SIR,—Having produced some experiments at our annual meeting upon sowing wheat, perhaps a few remarks in explanation will prove acceptable to those who feel interested in the results, much care and great pains having been taken to render them accurate.

The land selected for the trial is a mixed soil, deep staple resting upon marl, after a good plant of clover summer fed, and in good cultivation, and was planted on the 7th Nov., when it was wet and rather unfavourable for dibbling; and the rain which succeeded operated much against the experiments, as numbers of holes failed entirely, besides the loss of a great portion of seed which could not be detected; nevertheless the results are in unison and tolerably conclusive, and agree with a previous experiment.

QUANTITY OF SEEDS REQUISITE TO BE SOWN IN ANY GIVEN SPACE.

The following table, showing the requisite quantity of seed to be sown in any given space, cannot but prove acceptable, particularly to the inexperienced gardener or agriculturist, who is apt to run into the extreme of profusion in the sowing of his seed, or acting under the erroneous notion that the greater the quantity of the seed, the more prolific will be the crop. He has not the foresight to perceive that when the seed is too profusely sown, the plants are apt to choke each other, and instead of being strong and vigorous, they come up weak and sickly. The following table is rather upon an enlarged scale; but the private gardener can reduce the proportions of seeds according to the limited space of ground which he was to sow:—

ASPARAGUS.—If sown to transplant, one quart of seed will sow a bed of thirty square feet. If sown to remain, for a bed four feet and a half wide, and thirty feet in length, one pint is necessary. If plants a year old, a bed four feet and a half, by thirty feet in length, to contain four rows, nine inches distant in the row, one hundred and sixty plants will be required.

BEANS.—For early crops, one pint of seed will be requisite for every eighty feet of row; for principal crops, two quarts for every two hundred and forty feet of row, and for late crops, the same as for early.

BEANS, FRENCH OR KIDNEY.—For every eighty feet of row, the beans being two inches and a half or three inches apart, half a pint will be sufficient.

BET, RED OR WHITE.—For every fifty feet of drill, one ounce is requisite.

BROCCOLI.—Half an ounce will sow a bed of forty feet square.

BRUSSELS' SPROUTS.—One ounce will sow a seed-bed of forty feet square.

CABBAGE.—Half an ounce will sow a bed of forty feet square of the early crops; for the more luxuriant crops one ounce will sow a seed-bed of sixty feet square.

CAPSIUM.—A small paper, the produce of two pods of each sort, will be plenty for most families.

CARROT.—For a bed one hundred and twenty feet square, if sown broadcast, one ounce will be requisite; and the same quantity for every hundred and fifty feet of drill row.

CAULIFLOWER.—In the same proportion as broccoli and cabbage.

CELERY.—For a seed-bed of forty square feet, half an ounce is sufficient.

CRESS (GARDEN).—An ounce, or one-eighth of a pint, will sow a bed of fifteen feet square.

CRESS (AMERICAN).—If sown in drills, for every ten feet, allow a quarter of an ounce.

CUCUMBER.—From four to six seeds in each pot.

ENDIVE.—For a seed-bed of forty square feet, half an ounce is sufficient.

GOURDS.—From four to eight seeds of each variety, in separate pots, will be plenty for most families, excepting the vegetable marrow, where it is used; from ten to twenty seeds will afford an abundant supply.

KIDNEY BEANS.—See beans.

LEEKS.—One ounce is sufficient for a bed of thirty feet square.

LETTUCE.—The seeds of lettuce require room; a quarter of an ounce is sufficient to sow a bed of forty feet square, and will produce upwards of four hundred plants.

MELON.—From four to eight seeds in one pot, of the forty-eight size, or double that number may be sown if there be any doubt of the goodness of the seed.

MUSTARD.—Sow in the same proportion as for garden cress.

ONIONS.—For every forty square feet, allow one ounce of seed.

PARSLEY.—An ounce of seed will sow a drill of fifty feet long.

PARSNIPS.—Half an ounce of seed is usually sown in a bed of one hundred square feet.

PEAS.—For the small early kinds, one pint will sow a row of twenty yards in length; for the principal or large sowing sorts, the same quantity will sow thirty-three yards.

POTATO.—For a plot of early and secondary crops, eighty feet wide, by sixteen in length, planted in rows fifteen inches apart, and nine inches in the row, a quarter of a peck of roots or cuttings: for principal crops a compartment, twelve feet wide by thirty-two in length, planted in rows, two feet distant and twelve inches in the row, half a peck of roots will be required.

SAVOY.—The same proportion as cabbage, broccoli, &c.

TURNIP.—Half an ounce will sow every hundred square feet.

PRODUCE AND CULTIVATION OF CARROTS.

"The soil upon which the carrots were grown is not what is called a carrot soil, being a thin, clayey loam, having a blue, tilly subsoil, within a few inches of the surface. In fact, so stiff and unpromising was the soil at the period of sowing, and for some time after, (until the crop spoke for itself,) that very few who saw it ever thought there would be half a crop. It was drained and subsoiled, and last year carried a crop of Hopetown oats. At the first of November, 1848, manure from the farm-yard was carted up on the stubbles, and ploughed down. This manure consisted of the scrapings gathered during summer, and thrown into a pig-yard. Even of such manure as this was, there was far from being an extra allowance given, not more, certainly, than any farmer would put upon his po

tato ridges. In March and April the land was cross-ploughed, harrowed, and rolled, until made as fine as possible, the weeds carefully picked off, and about sixty barrels of Castle Espie lime applied to the Irish acre. This and five bushels of salt per Irish acre, was the only application in the shape of manure, except that which was ploughed down in November. The land was then, during the first week in May, formed into ridges five feet broad, with an alley of twelve inches between each ridge. These are similar to the common potato ridges. The seed (previously steeped for forty-eight hours,) was sown in rows across the beds, the rows being eighteen inches apart. I would particularly recommend this ridge system for growing carrots, parsnips, and of indeed, all green crops. It is especially suited to the small farmer, and even others may use it with advantage, for in a shallow soil, any depth can be obtained for growing the deep-rooted plants. The after culture consisted of thinning the young plants to seven inches apart, hoeing between the rows, and careful weeding. These after operations were executed by young girls, under the superintendence of a steady labourer.

"Now there is nothing extraordinary in these details. It is the common mode of cultivating green crops, except, perhaps, in so far as regards sowing the seed in ridges, and not in drills made by the plough; but this ought to be a circumstance which should be a recommendation to farmers in this country; it is just because there is nothing extraordinary in these details, that I have entered so fully into them, in order to show that successful cultivation is within the reach of even the poorest farmer, *provided he is possessed of ordinary industry.* Here there is no array of guano, bones, and other artificial manures, the very mention of which is quite sufficient to frighten men who cannot afford to purchase these valuable auxiliaries. Even the lime could in many cases be dispensed with, although necessary in this, from the excessively stiff nature of the soil and subsoil. People regret the loss of seven or eight tons an acre of potatoes, and the parrot cry of "it is impossible to prepare land for wheat without them," is to be heard on every side; but I can safely challenge any man to show land prepared for wheat either by potatoes or that abominable plan of bare fallowing, in better condition for wheat than the land under green crops in this demesne, and so may any person, who pays ordinary attention to the management of his crops."

stands the HOME FARM—or the farm attached to Windsor Castle—the private farm of her Majesty. In this establishment, which was founded by George III., is situated the royal fowl-house and poultry-yards, figured at the head of this article, but of which, notwithstanding their great interest, the public know nothing, save the mere fact of their existence. Here her Majesty, retiring from the fatigues of state, finds a grateful relief in the simple pursuits of a country life; and here, too, it may be, like Louis XVI. in the Jardin Anglaise, of the Petite Trianon, she seeks the renovation of those higher powers, which find their best, if not their only home, in nature or its God. In cultivating the homely recreations of a farm, her Majesty has exhibited great industry and much good taste. The buildings and the farm routine, which sufficed for the clumsy management of 1793, have been discovered, by her Majesty, to be totally unsuited to the more enlightened system of 1849, and hence, under the direction of her Majesty and Prince Albert, assisted by Lieutenant-Colonel Wemyss, Lord Lincoln, and Mr. Engall, her Majesty's intelligent and respected bailiff, an entire re-organization of the establishment has been determined, and is now in progress. In these pursuits, and in her continued prosecution of them, the Queen has, in our opinion, exhibited sound judgment and a healthy taste. There are some, we know, who would have the Queen to be "every inch a Queen"—even to the forsaking of her humanity. But, no! the Queen both thinks and acts after a very different fashion; and it has resulted that in all the royal arrangements of the present reign, there is to be found that love of neighbourhood, and that affectionate interest in the every-day furniture of life, which is so truthfully depicted in the following lines of a Scottish poet; and in which, we may be allowed to say, we most heartily acquiesce:—

"I love the neighbourhood of man and beast:
I would not place my stable out of sight,
No! close behind my dwelling it should form
A fence on one side, to my garden plot.
What beauty equals shelter, in a clime
Where wintry blasts with summer breezes blend
Chilling the day? How pleasant 'tis to hear
December's winds, amid surrounding trees,
Raging aloud! How grateful 'tis to wake
While raves the midnight storm, and hear the sound
Of busy grinders at the well-filled rack;
Or flapping wing and crow of chanticleer,
Long ere the lingering morn; or bouncing flails,
That tell the dawn is near! Pleasant the path
By sunny garden wall, when all the fields
Are chill and comfortless; or barn-yard snug
Where flocking birds, of various plume and chirp
Discordant, cluster on the leaning stack,
From whence the thrasher draws the rustling sheaves."

THE QUEEN'S POULTRY AND POULTRY-HOUSE, WINDSOR.—In a secluded nook, on the boundaries of the Home Park, sheltered from the prevailing winds, by stately clumps of elm trees,

We may be allowed, then, to agree with her Majesty in thinking, that the farm, the dairy,

and even the kennel of the Home Park, are amongst the best embellishments of the royal domain of Windsor.

The fowl-house, designed and built by Messrs. Bedborough and Jenner, of Sheet-street, Windsor, is a semi-gothic building, of simple and appropriate beauty. It consists of a central pavillion, used for inspecting the fowls—crowned on the top, by an elegant dovecot, and on the sides, of wings capable of symmetric extension, in which are placed the model roosting-houses, and laying and breeding nests of the fowls. The ground, in front, slopes towards the park, and is enclosed and divided by light wire fences, into separate wards for the “run” or daily exercise of the birds. Inside these wards, gravel walks, bordered by grass plots, lead to the entrance of the fowl-house. In the proportions, distribution, and fittings of the apartments of this house, considerable knowledge of the habits, with a corresponding and most commendable regard to the conveniences of their graminivorous tenants, has been displayed the chambers are spacious, airy, and of an equal and rather warm temperature, which accords with their original habits, and their nests are made, as far as possible, to resemble the dark, bramble-covered recesses of their original jungles. In this particular her Majesty has set a good example to the farmers of this country, who too often follow the false routine of their fathers, rather than consult the habits, and obey the natural instincts of the animals about them.

Her Majesty's collection of fowls is very considerable, occupying half a dozen very extensive yards, several small fields, and numerous feeding-houses, laying-sheds, winter courts, &c.

It is in the new fowl-house that the more rare and curious birds are kept—consisting of Coch-in-China, white Java bantams, some splendid bantams of Sir John Sebright's breed, a cock of which, remarkable for his martial bearing, is a great favourite with Prince Albert, with other fine bantams and some curious crosses, with grouse, and several frizzled fowl, remarkable for their silky, hair-like feathers.

The laying nests at Windsor are composed of dry twigs of heather—the Erica tetralix of our heaths—and small brambles of hawthorn, covered over with the lichen *raugiferinus*—the white lichen of our hedges, barn-doors, and park palings. These materials, rubbed together by the motion and pressure of the hen, emitted a light powder, the produce of the crushed leaves; and this, finding its way, between the feathers, to the skin, was found to have the immediate effect of discharging the bird of every description of parasite. The Commissioners of Woods and Forests are about to make considerable additions to this very interesting establishment.

A work on poultry would not be complete, if

a description of the most splendid poultry-house ever erected were omitted. The following is taken, on the spot, from that of

LORD PENRHYN.

The most magnificent poultry-palace, perhaps, that ever has been built, is that of Lord Penrhyn's at Winnington, in Cheshire. It consists of a handsome, regular front, extending about one hundred and forty feet, at each extremity of which is a neat pavilion, with a large arched window. These pavilions are united to the centre of the design, by a colonnade of cast-iron pillars, painted white, which supports a cornice, and a slate roof, covering a paved walk, and a variety of different conveniences for the poultry, for keeping eggs, corn, and the like. The doors into these are all of lattice-work, also painted white, and the framing green. In the middle of the front, are four handsome stone columns, and four pilasters, supporting, likewise, a cornice, a slate roof, under which, and between the columns is a beautiful mosaic iron gate; on one side of this gate is an elegant little parlour, beautifully papered and furnished; and at the other end of the colonnade a very neat kitchen, so excessively clean, and in such high order, that it is delightful to view. The front is the diameter or chord of a large semi-circular court behind, round which there is also a colonnade and a great variety of conveniences for poultry. This court is neatly paved, and a circular pond and pump are in the middle of it. The whole fronts towards a rich little paddock, in which the poultry have the liberty to walk about, between meals. At one o'clock a bell rings, and the beautiful gate in the centre is opened. The poultry being then mostly walking in the paddock, and knowing by the sound of the bell, that their repast is ready for them, they fly and run from all quarters, and rush in at the gate, every one striving which can get the first share in the scrabble. There are about 600 poultry, of different kinds, in the place; and although so large a number, the semi-circular court is kept so very neat and clean that not a speck of dung is to be seen. This poultry-palace is built of brick, except the pillars and cornices, the lintels and jambs of the doors and windows; but the brick are not seen, being all covered with a remarkable fine kind of slate, from his lordship's estate in Wales. These slates are close-joined, and fastened with screw-nails on small spars fixed in the brick; they are afterwards painted, and fine white sand thrown on, while the paint is wet, which gives the whole an appearance of the most beautiful freestone.

INFLUENCE OF BREED, CONSTITUTION, FOOD, SOIL &c., ON THE QUANTITY AND QUALITY OF THE MILK.—Both the quantity and quality of milk are affected by a great variety of circumstances. Every dairy farmer knows that his cows give more milk at one season of the year than at another, and that the quality of the milk also—its richness in butter and cheese, depends among other conditions upon the kind of food with which his cows are fed. It will be proper to advert to these circumstances a little in detail.

1st *The quantity and quality of the milk are affected by the breed.* Small breeds generally give less milk, but of a richer quality. Good ordinary cows in this country yield an average produce of from 8 to 12 quarts a day. Thus the dairy cows of

Devonshire give 12 quarts a day	
Lancashire.....8 to 9 qts., a day	
Cheshire and } 8 qts., a day	
Ayrshire	

During ten months of the year crossed breeds are in many districts, found more productive of milk than the pure stock of any of the native races. The influence of breed both on the quantity and on the quality of the milk appear from the following comparative produce of milk and butter for one cow of each of four different breeds in the light of the season, and when fed on the same pasture. The

	Milk	Butter
Holderness give 29 qts., and		38½ oz
Alderney.....19 “		25 oz
Devon.....17 “		28 oz
Ayrshire.....20 “		34 oz

Not only was the quantity of milk very different in the four cows, but the produce of butter also. The Holderness, in the quantity both of milk and of butter, being greatly superior to all other breeds.

The milk of the Holderness and of the Alderney breeds was equally rich in butter, as was the case also with that of the Devon and the Ayrshire since 1 lb of butter was yielded by 12 qts of milk from the Holderness cow
12 qts., “ Alderney cow
9½ qts., “ Devon cow
9½ qts., “ Ayrshire cow

The butter of the milk is for the most part, derived directly from the fat of the food, these animals, therefore which lay the smallest proportion of this fat upon their own bodies, will be likely to give the largest proportion in their milk. Thus the Ayrshires and Alderneys, which are good milkers are narrow across the shoulders, and *wiry and muscular* about the flanks. They give a rich milk but rarely fatten well. The *short horns* on the contrary, are celebrated for their fattening tendency; they deposit more of the fat under their skin and impart less of it to their milk.

2nd. But the *individual form and constitution of the cow* causes both the yield and the richness to vary much among animals of the same breed. Every dairy farmer knows that some Ayrshire or Holderness, or Devon cows are better milkers than others. And even when they yield nearly the same quantity of milk, the richness or produce in butter may be very unlike. These four cows of the Ayrshire breed, fed on the same pasture, gave in the same week,

	Milk.	Butter.
First,.....	84 qts., which yielded	3½ lbs.
Second and third, each	86 qts., “ “	5½ lbs.
Fourth,.....	88 qts., “ “	7 lbs.

so that the fourth, though it produced only four quarts more milk, gave twice as much butter as the first. Individual cases of extraordinary productiveness occur now and then. Thus a Durham cow belonging to Mr. Hewer, of Charlton, Northampton, gave in the height of the season 8 imperial gallons of milk in a day, yielding 3lbs. of butter. A cow upon ordinary keep has been known also to produce as much as 350 lbs. of butter in a year. The tendency to yield butter is no doubt constitutional, like the tendency to lay on fat.

3rd. The *kind of food* also exercises, as all cow-feeders know, much influence upon the quantity and upon the richness of the milk. The Swedish turnip gives a richer milk, the white globe a larger quantity, while both are said to cause a greater yield of milk when tops and bulbs are given together. Culpepper recommends the leaves of the black alder as a fodder for causing cattle to give much milk. Spurry is said to have a similar effect. When fed on grass and Brewers' grains the cow yields a larger quantity of milk; and when fed on malt dust she drinks much and milks well.

It is believed also that leguminous plants, clover, tares, &c., promote the production of cheese, while oil-cake, oats, Indian corn, and other kinds of food which contain much oily matter, favor the yield of butter. The cakes left by oily seeds, linseed, poppy seed, dodder, sesamin, give a milk which contains more solid matter and is richer both in butter and cheese, if the cake be not old or rancied, it does not impair when given in moderate quantities, but rather increases the flavour and pleasantness of the butter.

If the food contains little fat, the animal still produces butter. It robs its own body of fat, becomes leaner, and for a time yields more fat in the form of butter than it has eaten in its food. Where only a part of a dairy of cows is kept for their butter, and the rest for cheese, the buttermilk from the former may be given to the latter, and thus the produce of cheese increased.

4th. *The nature of the soil* also in which grow, and the manure by which they are raised, affects their influence upon the milk. It has been

known from most remote times, that when fed upon one pasture, the cow will yield more butter, upon another more cheese. This difference must depend upon the soil. Again it has been found by experiment, that vetches grown upon well-limed or marl land promote the production of cheese, while after manuring with wood ashes, they increase the quantity of milk and of cream (Sprengel) in Cheshire the addition of bones has greatly increased the value of the grass, and the produce of milk and cheese.

On this curious subject numerous experimental researches are still required.

5th. The milk is affected also by a *variety of other circumstances*—its quantity depends very much upon the distance from the time of calving—diminishing as the calf gets older, this is no doubt a natural adaptation to the wants of the calf which in a state of nature gradually ceases to require support from its mother. A cow which during the first fifty days after calving yields 24 quarts of milk a day may yield no more than 6 quarts after six months have elapsed.

The quality of milk is better from cows that are in good condition and have already been two or three times in calf. It is richer in warm climates, in dry seasons, and when the cow is not too frequently milked. It is said to be richer when cows are kept constantly in the house—those which go at large in the pasture yielding more cheese. When a cow is allowed to dry for two or three months before calving, it is believed to give more milk the following season. In autumn it is riched upon the whole, giving a less proportion of butter, but a greater of cheese (Aiton) while it becomes poorer in both when the cow is in calf. The first milk which comes from the udder is also poorer than that which is last drawn, the *streppings* or *stroakings*—and lastly the quality of the milk is very much affected by the treatment and moral state of the animal. Gentle treatment and a state of repose are favourable to the richness of the milk—while anything that frets, irritates, or harasses the animal injures its quality.—*Johnston's Elements of Agricultural Chemistry and Geology.*

The foregoing remarks are valuable to every farmer who keeps a dairy stock—as they can be relied upon, we believe, in every particular.

THE VEGETABLE BANQUET.—(*From Punch.*)—That highly-respected vegetable, the Potato, being now, it is hoped, thoroughly re-established in health, it was determined by a few leading members of the Vegetable Kingdom to offer a banquet to the worthy and convalescent root on his happy recovery. The arrangements for the dinner were on a scale of great liberality, and the guests included all the principal vegetables. The invitations had been carried out by an effi-

cient *corps* of Scarlet Runners, and the Onion occupied the chair. He was supported on his right by the head of the Asparagus family, while Salad occupied a bowl at the other end of the table, and was dressed in his usual manner. The Potato, though just out of his bed, was looking remarkably well, and wore his jacket, there being nothing to mark his recent illness, except perhaps a little apparent blackness round his eyes. After the cloth had been removed, the Onion got up to propose as a toast, the Potato, their much respected guest. (*Immense cheering.*) He, the Onion, had known the Potato from infancy; and though they had not always been associated in life, they had frequently met at the same table. They had sometimes braved together the same broils, and had found themselves often together in such a stew (he alluded to the Irish stew) as had brought them, for the time being, into an alliance of the very closest kind. He, the Onion, was delighted to see the Potato once more restored to his place in society; for he, the Onion, could say, without flattery, that society had endeavoured to supply the place of the Potato in vain. (*Hear, hear.*) They had heard of Rice having been suggested to take the place of his honorable friend, but the suggestion was really ridiculous. *Risum teneatis, amici*, was all that he, the Onion, had to say to that. (*Loud laughter, in which all but the Melon joined.*) He, the Onion, would not detain them longer, but would conclude by proposing health, long life, and prosperity to the Potato. The toast was received with enthusiasm by all but the Cucumber, whose coolness seemed to excite much disgust among his brother vegetables. The Onion had, in fact, affected many of those present to tears; and the Celery, who had sat next to the Horseradish, hung down his head in an agony of sensibility. When the cheering had partially subsided, the Potato rose, but that was only a signal of renewed enthusiasm, and it was some minutes before silence was restored. At length the Potato proceeded nearly as follows:—Friends and fellow vegetables.—It is with difficulty I express the feeling with which I have come here to-day. Having suffered for the last three or four years from a grievous disease, which seemed to threaten me with total dissolution, it is with intense satisfaction I find myself once more among you in the vigour of health. (*Cheers.*) I should be indeed insensible to kindness, were I to forget the anxious inquiries that have been made as to the state of my health, by those who have held me in esteem, and sometimes in a steam. (*A laugh, in which all but the Melon joined.*) I cannot boast of a long line of ancestors. I did not, like some of you, come in with the CONQUEROR, but I came in the train of civilization amidst the memorable luggage of Sir Walter Raleigh, in company with my right

honorable friend the Tobacco, who is not now present, but who often helps the philosopher to take a bird's eye view of some of the finest subjects for reflection. (*Immense cheering, and a nod of assent from the Turnip Top.*) Though I may be a foreigner, I may justly say that I have taken root in the soil; and though I may not have the grace of the Cucumber, who seems to have come here in no enviable frame, (*loud cheering.*) I believe I have done as much good as any living vegetable; for, though almost always at the rich man's table, I am seldom absent from the poor man's humble board. (*Tremendous applause.*) But," continued the Potato, "let me not get floury, or mealy-mouthed, though there is nothing objectionable in either extreme. I have undergone many vicissitudes in the course of my existence. I have been served up, aye, and served out (*a smile*) in all sorts of ways. I have been roasted by some; I have been basted by others; and I have had my jacket rudely torn off my back by many who knew not the treatment I deserved. But this meeting, my friends, repays me for all. Excuse me if my eyes are watery. (*Sensation.*) I am not very thin-skinned; but I feel deeply penetrated by your kindness this day." The Potato resumed his seat amid the most tumultuous cheering, which lasted for a considerable time.

KYLE-PARK NATIONAL AGRICULTURAL MODEL SCHOOL.

Our attention has been directed to the above-named institution, which promises to be of so much advantage to the locality where it is situated, and to lead to the diffusion of agricultural knowledge in a more extended sphere, if those of the farming class, still in a position to do so, would avail themselves of the opportunity offered, and place their sons in a situation which would doubtless be securing for them a comfortable provision in after life.

We are now enabled to state that the handsome and extensive buildings known as the Kyle park School have been for some time in the possession of the Commissioners of National Education, who have also become tenants for about eighteen statute acres of the adjoining lands, to cultivate them as a model farm for the practical instruction of the pupils, on the same system as that followed at Glasnevin. The entire of the buildings—comprising two large school-rooms, apartments for teachers, dormitories for boarders, dairy, and range of farm offices—have just undergone repairs and improvements to a great extent, and at a considerable expense, rendering the establishment a most creditable one to the commissioners, ornamental and useful to our county, and such as it not surpassed in architectural beauty by any institution of its size in Ireland. In fact, to estimate fully

what the Kyle-park School now is a personal visit to it would be necessary, as our description of it must fall far short of the reality; and we say to our readers to look and judge for themselves.

To carry out the object of the school in all its branches, the commissioners have placed there two masters, the one having charge of the literary, the other of the agricultural department. A female teacher is also to be appointed, whose duty it will be not only to instruct girls in the ordinary course of elementary education usually followed at national schools, but also in needlework and other industrial works, calculated to be of advantage to females. Ample accommodation has also been provided for indoor pupils or boarders, several of whom can be received, and that at the moderate charge for each of five pounds per annum, the commissioners defraying the further expenses necessary for their support, and giving those pupils the advantage of admission to the Glasnevin Model Agricultural School, free of all cost, so soon as they shall be so far advanced in their education as to be qualified to obtain the privilege of admission—a privilege of no ordinary kind, and one which should not be lost sight of.

To secure to the utmost the well-working of the Kyle-park School, and other like agricultural institutions, under the control of the National Educational Board, for the establishment and support of which the legislature has lately considerably augmented the annual education grant, an inspector of agricultural schools has been appointed by the commissioners, and from the well-known scientific and practical acquirements possessed by Dr. Kirkpatrick, the gentleman who holds the office of inspector, the public have a sufficient guarantee that in all the details connected with agricultural schools, every care will be taken to make them efficient. We understand, further, that to Mr. Stoney, of Kyle-park, by whose exertions, if not at whose expense, the establishment had its origin, is committed the local management of the school, as its patron. So that upon the whole, we have the fullest assurance which can be given in such a case, of the best results arising to our county from the institution. And, in conclusion, we entreat of landlords, and other parties interested in the improvement of this country, to aid by their influence and exertions, in drawing the attention of farmers to the advantages offered on such favourable terms.—*Nenagh Guardian*

TRUTH.—Truth is always consistent with itself, and needs nothing to help it out; it is always near at hand, and sits upon your lips, and is ready to drop out, before we are aware; whereas a lie is troublesome, and sets a man's invention on the rack, and one trick needs a great many more to make it good.

Agricultural Journal

AND

TRANSACTIONS

OF THE

LOWER CANADA AGRICULTURAL SOCIETY.

MONTREAL, JANUARY, 1850.

THE NEW YEAR.—We beg to offer our most sincere congratulations to the subscribers to this Journal on the commencement of the new year, and we wish them all possible health, happiness, and prosperity. To the agriculturists, we wish a favorable season, abundant crops, and remunerating prices, and to the non-agriculturists, ample funds to purchase the produce of the soil at reasonable prices. There is a never failing encouragement to the husbandman, that if he executes his part properly, he has to rely upon a Bountiful Creator to give him the reward of his toil, and this reliance is scarcely ever disappointed. Seed time and harvest never fail us, and the harvest generally rewards us in proportion to our careful cultivation of the soil. There is no occupation of mankind that has a more certain and never-failing source to rely upon than the agriculturists, and this alone should attach us to agriculture.

AGRICULTURAL REPORT FOR DECEMBER.

The winter may be said to have commenced about the 1st of December, although rather mildly. We had not very severe frost, or much snow, previous to the night of the 22nd, but from that day to the 30th, a large quantity of snow fell, and the thermometer went down to 17° below zero on the night of the 25th, with a high wind and drift. We were glad to see the land covered deeply with snow before we had much severe frost, as we think it is always beneficial, in a Canadian winter, to have the soil covered, particularly meadows and pastures. The Canadian winter,

far from being injurious to agriculture, is, on the contrary, beneficial—where the lands are prepared properly in the fall by draining and ploughing, the frost and snow have a good effect, and they give bridges and roads to the farmers of the remotest sections of the country, who would be shut out from our markets if they had not this convenience furnished without labour or cost to them. Every country possesses advantages the most suitable to its situation and circumstances, and our severe winters are not the least of our advantages. We require of course to provide good shelter and good food for our animals, and for ourselves; but when this is duly attended to, our winters will not be injurious to us, but the contrary. We would not think it desirable that they should commence on the 1st of November, and continue to the 1st of May; but commencing as this year, about the 1st of December, and continuing, (as we hope,) only to the first of April next, we shall have no cause to complain of a long winter. It is not of frequent occurrence that the winter continues after the 1st of April, or commences much before the 1st of December. We have frequently sown grain in this country from the 1st to the 7th of April, and if the soil is properly ploughed, and sufficiently drained in the fall, sowing may generally commence early in April, and the exceptions to this rule will not be of frequent occurrence. It may appear doubtful to some parties; but we are persuaded that a skilful and industrious farmer, possessed of sufficient capital, will have it in his power, by judicious management, to lengthen the summers and shorten the winters, so far as it would be advantageous for him to do so. It is the unskilful and neglectful farmer, that complains most of unfavorable and short summers and long winters; because his land is not ploughed properly, or drained sufficiently to admit of his sowing in time, or harvesting in good season. This management has the effect of forcing the

work of one season into another, and not affording time or the most favorable opportunity for executing any work, or giving the crops a fair chance of the growing season. In our climate, it certainly does require that work should be executed, if possible, to the day; and loss is generally the result when this cannot be accomplished. The object of this reasoning is to convince farmers that our climate is no reasonable excuse for bad farming and inferior crops; and so far as we are capable of judging, we would not exchange our country, our soil, or our climate, for that of any other State on this continent, notwithstanding all that is urged against our short summers and long severe winters. We may not be able to produce sugar cane, rice, or cotton, or many other tropical productions; but we are persuaded that this country can produce, *upon an average*, as heavy crops of wheat, barley, oats, rye, buckwheat, peas, beans, Indian corn, potatoes, turnips, carrots, parsnips, mangel wurtzel, hay, and grass, as any country on the continent, from the Northern Frozen Ocean to Cape Horn. We can also have domestic animals of every variety, as useful and profitable, (if not all so large,) as those of any other country in America, without exception. We are aware this is a bold assertion; but we make it advisedly, after a long residence in the country, and the most careful study of the subject; and we trust no true friend of Canada, or of the prosperity of her population, will dispute our proposition, without very sufficient grounds for doing so. We advocate the improvement of our agriculture, and we maintain there is nothing in our climate or soil to prevent its profitable improvement. Large crops of wheat, may, in some instances, be produced in other countries, from fall sowing on fertile soil; but we feel almost certain, that even wheat, by careful management, and a selection of the most suitable varieties, we could raise in Lower Canada, as large an

average as they generally do in the United States; and of other grain, roots, and hay, our averages here may be much larger than in that country. It may answer a good purpose, that we should, at the close of the past year, that has undoubtedly been a favorable one for producing crops, submit our proposition, that this country is not inferior to any other for agriculture, unless we make it so by our want of skill, neglect, or want of capital to improve its natural advantages to the uttermost. It would be foolish or useless to propose or suggest improvements that it would be impossible to introduce in consequence of inferior or unsuitable soil, unfavorable seasons, summers that were too warm, long winters, excessively severe frost, and very deep snow. This character of this country may pass for a satisfactory excuse for those who are not disposed to introduce improvements in their system of husbandry; but it will never be urged by those who know Canada and its capabilities, and desire to improve them or see them improved. We possess the natural requisites here for a successful agriculture. What is required is skill, capital, and energy, to make the most of our natural advantages. Prices of produce may not satisfy the farmers; but even this may be changed for the better by skill and judicious management, and growing the crops that will be most and constantly in demand. A better system of agriculture would enable us to cultivate such crops as would be most suitable and profitable for us, and if we had to grow much of oats, barley, buckwheat, or Indian corn, we would know our interest better than to sell these grains at a very low price, but rather to manufacture them into beef, pork, or the feeding of our own cattle and sheep. The waste of breweries, distilleries and mills, are sold out of all proportion to the prices paid for grain. Bran sells for more than half what is paid for wheat—by weight—and the waste grains of brewers and distillers averag-

ing—all the grain they make use of—is, perhaps, sold for near a third of what is paid for the raw grain. We do not offer any objection to this; we only propose to those who may have to buy these wastes, rather to have the raw grain, with all its substance in it, ground up for their cattle, and we can assure them, they will find it a much more profitable plan. A small quantity of ground oats or barley, given with hot water to cattle, will be found the most economical mode of feeding for the butcher or the dairy. There is as much prudent management required in the judicious use and disposal of the crops after they are produced, as there is in the careful cultivation necessary for producing them; and both are essential to the prosperity of the farmer. We have no doubt that many farmers, who come a long distance to our markets with oats or barley, at the present low prices, would be considerable gainers by feeding these grains to their cattle and other stock, many of which may be reduced to very low condition, or perhaps to death, for want of them, before the end of next spring. The produce of a few acres of oats, barley, or Indian corn, fed out to a farmer's stock during the winter, would produce immense improvement in the stock, and in the farm profits. This matter is deserving of the most serious consideration of farmers. It is upon wheat, and upon his stock of cattle, horses, sheep, and swine, he should chiefly depend for his money income. Much time is wasted in coming a long distance to market with a load of produce that will not sell for more than a trifling amount, that would scarcely pay a reasonable remuneration to the farmer for his time and other expenses. The judicious consumption of this produce upon the farm, by manufacturing it into butchers meat, butter, and the improvement of the stock generally, would be a much more profitable employment of it, than transporting it a great distance to sell it at a low price. One shil-

ling, or fifteen pence a bushel for oats, containing ten gallons, and weighing from 30 to 40 lbs., is cheaper food than hay, at 30s. to 40s. per hundred bundles of 1600 lbs. Barley at 1s. 8d. to 2s., per bushel of 50 to 56 lbs., is also cheaper food than hay. Of course, neither of these grains can be substituted altogether for hay, but given with hay or straw in small quantities, the stock would benefit greatly by such a mixture of food. The farmer's own family might make use of a proportion of oat-meal, rather than sell oats at prices that will not yield over from 20s. to 30s. per arpent, for a crop on an average. This return will not pay for the expenses of cultivation, &c., leaving no rent for the land—and this, we are convinced, is frequently the case—but it is the farmer's own fault—to dispose of produce at very low prices, when he might apply it to a better and more profitable purpose. There may be a great difference in the actual amount realized from the same varieties, and quantity of products raised upon a farm. One man may apply all, and dispose of all to the very best advantage—while another man may exactly do the contrary, and not realize half the amount of the first man. One man may keep his stock so well that some of them will be constantly yielding a return, and all greatly improving in size and value, while the other man neglects his stock, they yield no return for their keeping, and are of much less value in the spring than in the fall, and perhaps, some of them die from insufficient keep and neglect. This is the management that causes some farmers to be prosperous, while others never improve their condition, and are likely to attribute their want of success to anything but the proper cause. We have often thought it a strange circumstance to see a farmer, the proprietor of one hundred arpents of land or more, a good house and farm buildings, a stock of horses, cattle, sheep and swine, farm implements, &c. &c.,

travel from 30 to 100 miles or more to sell a few bushels of oats or barley, that would not bring him, perhaps, more than from four to eight dollars in cash for his load, and for his time and expenses. It is quite absurd to think a farmer in such a respectable position, should so greatly misapply his produce, and his own time. We know, at all events, that such management will never allow of any great improvement in the condition of the farmer who practices it. Indeed it would be impossible for him to realize his own, only that he gives his own labour for nothing, or estimates it at nothing. If by following a better system, and keeping their inferior grains at home, they could have a good horse or two to sell annually, a few good oxen, milch cows, some pork, and good butter or cheese—they would find themselves much better, and in a more independent condition very soon, than by the present general system of going long journeys to market to sell a load, or an animal that was not bringing much cash. Their sheep and cattle would be purchased at their farms by drovers or jobbers, who would soon find it convenient to go to them, if the farmers would not be constantly going to town from remote sections of the country, with a lamb, two or three sheep, or any other animals of not much value. These matters have a great influence on agriculture, and on the real profits derived from it, and we recommend the subject most earnestly to farmers' attention. Every expense should be avoided, of time or money, that diminishes the farmer's produce when selling, from twenty-five to seventy-five per cent of its amount. We have extended this Report considerably more than we intended, but we have done this from a desire that farmers—now, when they have leisure—should consider what we have submitted for their consideration, and act upon our suggestions if they find them reasonable. They may not have taken the trou-

ble to reflect on these matters, but we conceive it to be our duty to do so, while we occupy our present position. The past year has been very favourable throughout, to the farmers, and we only wish the present year to be equally so. The produce may not in all cases be satisfactory, but we certainly do not admit that the season was to blame for this. There has been considerable loss in potatoes by the usual disease, with many farmers, but even this loss, we conceive, might be lessened by more careful cultivation and storing. Large quantities of manure, we know to be injurious, and should not in any case, be applied to the crop. The use of charcoal applied in the drills, when the seed is planting, we believe, would be beneficial. Storing them in small quantities, and in a temperature not too warm, is also necessary. Prices of produce are undoubtedly low, but we have suggested in this Report, a change in the general system of disposing of low priced grain, that, if adopted, would, we hope, prove very advantageous to farmers. Our suggestions may not be suitable in all situations, and under every circumstance, but they may be safely tried in almost all situations, very remote from Montreal. There can be no doubt, whatever, that if the farmer's stock of animals require better keep than is usually supplied to them, he will be a gainer by feeding his oats and barley to them, rather than selling them at a low price. In conclusion, we hope, that should we be spared to make an Agricultural Report at the close of the present year, we may have it in our power to congratulate farmers on a most propitious season, fine crops, remunerating prices, and a manifest progress in the improvement of Canadian husbandry. This is our sincere wish, and our humble exertions shall not be wanted, so far as regards the management of the Agricultural Journal.

January 2nd, 1850.

EDUCATION.—We have for a long period endeavoured to advocate the necessity of providing an Agricultural Education for the youth attending at country schools. We are aware that it would not be practicable to provide this education generally, and immediately, until there would be Schoolmasters properly qualified to impart this instruction. While, however, we have to wait for properly trained masters, what is to prevent us from introducing suitable agricultural books into our country schools for the reading of our youth? We do not hesitate to say, that we could name many books referring to the science and art of agriculture, that would be as suitable for the reading and study of farmers' sons while at school, as most books that are at present provided for them. We cannot understand the motive for excluding from the country schools, the books that are the best adapted for the use of the scholars. There is much less of exceptionable matter to be found in agricultural books, than the generality of school books we meet with. It appears to be a great absurdity that in the country schools provided almost exclusively for the children of agriculturists, they never have an opportunity of seeing or hearing a single sentence that has any reference to the employment of their fathers, or that which should occupy their own future lives. The whole tendency of their teaching and reading is in quite a different direction, rather than to the fields of their fathers, and to their judicious cultivation; so that every day they return to their father's house from such teaching they are less disposed, and less fitted to become industrious and skillful cultivators of the soil, and less attached to a country life. This subject is of more consequence to the real prosperity of Canada than most parties imagine. Indeed, the judicious teaching of the farmers' children is of vast importance to the well being of the country. We do not say that not one of the sons of farmers should be allowed to go to any other business but farming, but we do say, that their education

and reading should be such as not to estrange them from agriculture, and direct them to the practice of other professions, rather than agriculture. Let their reading teach them to know that the business of the husbandman is the most useful and honorable that man can be engaged in, and that every profession on earth has to be supported from the products of the land. The education of farmers' children should, if possible, be connected with the cultivation of the field or of the garden. It should be constantly impressed upon their minds, that the object of their education is not to induce them to forsake the occupation of their fathers, but to enable them to practice the same business with more success and satisfaction to themselves. It is greatly to be regretted when sons of farmers fancy that there is less work, and more money, show and enjoyment, to be obtained in other occupations than in agriculture. It is such ideas that attract the most talented of the rural population from the country, and deprive agriculture of advantages that ought to belong to it. If youth are encouraged to look forward to the acquisition of fortune or high station, as they generally are, by the sort of reading and education they have at schools—it is not to the country or to agriculture their attention is directed to seek this fortune or high station. Perhaps it would be the last business or occupation that would be recommended to a youth for the acquiring of fortune, or a respectable station in Canadian society, by the generality of school masters. Until there is a total change in this system, we despair of any great and permanent improvement in our husbandry. We cannot conceive why an unsuitable and defective system of education for the rural population should have been persevered in so long, and we hope the subject will now obtain due consideration, and if a better system is possible that no obstacle shall be permitted to prevent its immediate introduction. The friends and supporters of the present system, if they wish to continue it, are at least bound to show that it is a suitable

ble, and the best system of education that is practicable for the rural population; and until they do this, we shall maintain our proposition—that it is not so. Perhaps we may be told, the people have it in their power to make such changes as they conceive to be proper or useful, and this may be true. But, with our population, it is necessary that some general principle be established for the government of country schools, and at least one model school be provided in each county at once, which would soon afford us qualified schoolmasters, for all other schools to be conducted upon the same plan as the model school. The education and teaching of the children of the rural population is not a matter to be treated lightly or with indifference, but requires the most serious consideration, attention—and action, when we have arrived at a proper conclusion on the subject. Every inhabitant in Canada is interested in it. We do not propose any measure that interferes with religion, parties or politics—nor do we presume to meddle with the education of any class, but that of the agricultural population. For them we would be most anxious that such an education should be provided as would best qualify them to become good and successful farmers, and at the same time be capable of acting in any capacity which the government or the country might require of them, with credit and honor to themselves, and with advantage to their country. We would be the last to wish that farmers should not obtain a good education. We only wish them to be so educated as not to produce any dislike or disinclination in them to the most honorable and useful profession on earth. Any young man, who, after having an opportunity of knowing something of the science and art of agriculture, and all the pleasures that belong to the practice of husbandry under a good system, who is disposed, after all, to choose some other occupation—let him go to it by all means; agriculture can very well spare all such. We seldom see the sons of classes

not agricultural, after coming from school, become farmers, but we see every day, the sons of farmers, after they come from school, become anything rather than agriculturists. There must be something decidedly wrong that leads to these results, as they are results that unquestionably do not tend to advance the prosperity of Canada. No man, however great his talents, or high his rank, can employ himself more usefully for Canada, than as an agriculturist residing in the country. We have no object in bringing this subject so constantly before the public, but to induce others to give it due consideration. We should not do our duty as Editor of this Journal, unless we submitted what appeared to us to have a great and injurious influence on the state of agriculture, and suggest some measures that, we conceived, would change this injurious influence, and cause our system of education to act beneficially for the improvement and prosperity of agriculture.

CANADIAN HORSES.—We refer again to this subject that is of so much consequence to Canadian farmers. We see almost every day in Montreal, citizens of the United States who come here to purchase these horses at a fair price. Farmers might considerably augment the value of the produce of their farms, by raising good Canadian horses, free from all mixture, or cross with other breeds. A young horse would not cost very much more to three years, than an ox to four years old, and the difference of value for sale would be perhaps from twice to six or eight times as much in favour of the horse. We are by no means advocates for keeping a large stock of horses if not required for work—but as a market has been raised up for the sale of good horses for a foreign country, we should by all means endeavour to raise a supply for it, that will realize cash. There is more encouragement to do this, as the market is likely to be a permanent one, and the demand appears to be

only limited by the supply. The profit of raising horses will be greatly influenced by the sort of animals raised. It may take as much to raise a horse that would only be worth ten pounds as one worth twenty or thirty pounds; and therefore it will be of great consequence that good animals be raised, as it is only such that will leave much profit to the breeder. It is not horses that are very high priced that would be most suitable or find the most certain market and demand, but those of a good description fit for agricultural purposes, and for labour at their public works, and in their cities and towns. Horses that would sell for sixty to one hundred and twenty or fifty dollars each, will always be most in demand and find most purchasers, and these prices would pay the breeders. We recommend this matter to the attention of farmers, particularly those residing beyond convenient distance from our cities—Should the market fail at any future time it will be easy to discontinue the breeding of horses, and turn our attention to some other products. We do not advise any farmer to enter extensively into the business, but those who can, might raise a few horses annually, that would prove of great assistance in the increase of the value of his farm produce.

We report with great satisfaction the establishment at Vaudreuil of the Canadian Glass Manufactory, by Messrs Boden and Le Bert. We have been assured by one of the firm, that they will be prepared to execute promptly any orders that may be sent to them, at moderate rates, provided that models are sent for any particular article required. The manufactory is in a very convenient situation, as there is cheap means of communication to it from all quarters. We sincerely wish it success. We have frequently recommended glass milk pans for dairies, as the best that could be made use of, particularly in this country. They are easy to keep clean, and never impart any unpleasant

flavour to milk or cream. They are to be manufactured immediately at Vaudreuil and we hope sold at such a price as will enable farmers to purchase them in preference to milk pans of any other material. This is a manufactory that deserves every encouragement. The material is native produce, worked by native or emigrant labour, which is all our own. We hope to see manufactories established that will supply us on better terms, and with better articles than could be imported. They would act as a great encouragement to agriculture, if conducted on a proper principle—giving good articles at fair, (not exorbitant) prices. They cannot expect to thrive, or be encouraged on any other conditions. It is not desirable to have home manufacturers, which pay as low prices as possible for the raw material that is raised by the farmers, and sell the manufactured produce at higher prices than the article is worth, according to quality. This, we conceive, is not an advantageous system to be encouraged, and certainly should cure itself by fair competition; but this remedy is not always so easy as one might imagine in Canada. Domestic or native manufactures can never be permanently successful, unless those who establish them make good articles, and rest contented with moderate profits.

We have received our exchange papers by the last English mail, and they contain much of interesting information on the subject of agriculture, and ample encouragement to adopt improved systems of husbandry. We perceive by a statement submitted by the Secretary of the Royal Irish Agricultural Improvement Society, that although the expenditure in premiums, &c. &c., at the last great Annual Cattle Show of the Society, held in Dublin, amounted to £1,350, all the expenses of the show were defrayed by the receipts, and the Society had not to advance one shilling towards it from their other funds.

We believe that the Royal English Agricultural Society is a considerable gainer by its great Annual Cattle Shows, &c., from the large receipts at these shows, and from the circumstance, that the city or town fixed upon, where the show is to be held, contributes generally towards the funds of the Society, one thousand pounds sterling for the advantage of holding the show at the place. The Lower Canada Agricultural Society may reasonably expect some aid from the citizens of Quebec towards the Cattle Show proposed to be held there next fall. If the show is anything like what it should be, a large assemblage of persons may be expected there that cannot fail to serve Quebec. We had an opportunity of ascertaining, from good authority, the great benefit derived by the citizens of Syracuse last September, from the great Cattle Show held at that place. We were also told that the receipts on the Railroad from Utica to Syracuse, a distance of about 50 miles, during the week of the great Fair, exceeded, by 10,000 dollars, the receipts on the same road for the same period of September, 1848, over and above paying all extra expenses caused by the increased number of passengers. What should prevent us from having a great Cattle Show, and exhibition of implements, and other products at Quebec?

The circulation of this Journal is much more extensive than any paper published in Lower Canada, particularly among the rural population, and would consequently be an excellent medium for advertising all articles likely to be required by farmers, or purchased from them. Insertions will be given on the usual terms charged by other papers. It is not desired to take advertisements from other journals; but we invite advertisements connected with lands, or referring to articles required by agriculturists, for insertion in this Journal. The circulation in both

languages has extended to between three and four thousand copies; although we regret we cannot add they are all to paying subscribers. We believe, however, that advertisements in this paper will be as widely and generally known as they would in any other paper published in Canada, and we hope encouragement in advertising during this year.

Mr. Fleck, the agricultural implement maker, has been very successful in the sale of some of his implements, his grubbers in particular, of which he has sold all he has made, and has orders now for many more before the spring. Mr. Fleck's implements have the strong recommendation of being exceedingly well made, as any we have ever seen. We have heard from a gentleman who has purchased and worked one of these grubbers, that it answered a very good purpose, and gave him perfect satisfaction. We are well pleased that Mr. Fleck's implements will bear comparison with any made on this continent, or imported. He has not a sufficient variety certainly, but is prepared to execute any orders he may receive for any implement required. He deserves encouragement, and we hope he will obtain it. He was awarded several prizes at the Provincial Show held at Kingston, last September; and is likely to be equally successful at the Exhibition at Quebec next fall.

In the last published Geological Survey of Canada, T. S. Hunt, Esq., Chemist and Mineralogist to the Provincial Geological Survey of Canada, reports having discovered, in the fourth lot of the eighth range of the Township of Burgess, (we believe not far from Perth,) phosphate of lime, of great value, for agricultural purposes. W. E. Logan, Esquire, Provincial Geologist, showed us a portion of this phosphate, and assured us that it was double the value of bone dust, as manure for crops. We do not pretend to be able to

form any idea of its value, but the report of Mr. Logan and Mr. Hunt is very encouraging, to try this phosphate in agriculture, and if it should prove of such value as these gentlemen suppose it to possess, it will be of great consequence to the agriculture of the country. The Royal English Agricultural Society, some time ago, sent out an eminent Chemist to Estremadura, in Spain, to examine a deposit of rich phosphate, said to exist in that country. We believe the gentleman who was sent found the phosphate to be fully equal to what it was previously represented, but that the expense of such a long carriage would prevent its being brought to England to be employed to advantage as a manure. There is much valuable information in the Reports of the Geological Survey of Canada, and we shall occasionally copy extracts from them. We give below a few lines from Mr. Hunt's report of the phosphate of lime discovered by him:—

"The attention of scientific agriculturists has within a few years been much directed to the important part sustained in the vegetable economy by phosphates, and the great fertilizing powers possessed by phosphate of lime, particularly in the form of bone manure, are universally recognized. With a view of obtaining some cheaper source of this substance, some enterprising Englishmen have lately been exploring a deposit of native phosphate of lime in Spain. Under these circumstances, the limestone thus described, which contains throughout it, a large supply of this important substance, is certainly well worthy of the attention of our agriculturists. The rock might be directly ground to a powder and applied to the soil, or previously burned to lime, when the united virtues of the phosphates and of quick lime would be rendered available to the soil. In two or three other places, the limestone has been observed to contain large quantities of this mineral disseminated, and doubtless in sufficient abundance to supply any demand. The phosphate of lime is largely contained in wheat; and the exhaustion of this ingredient is one great cause of the sterility of our worn-out wheat lands. In a grain-growing country like Canada, therefore, the existence of such deposits as these will prove of great importance."

We also have seen Mr. Logan's report of whet-stones and soap-stone, found in the

Eastern Townships, which might both be made available to considerable advantage, as the articles will ever be in demand. Mines of this description will be more valuable to work in Canada than perhaps any other we could discover. Mr. Logan says, the rough stone is taken from Canada by the neighbouring States—are dressed and made into shape there, and then brought back and sold in Canada. We certainly cannot understand why this should be the case, and are not aware that it can be attributed to any cause, except want of sufficient enterprise in the inhabitants of Canada. We hear much of the backward state of this country, while we neglect to improve the advantages that are at our feet.

In the Message of the President of the United States to Congress, the interests of Agriculture are not forgotten. We copy a short extract from that Message. There are many things in the United States which it would be advantageous to us to follow their example in, and in none more than what they do for the advancement of agriculture, its improvement and prosperity. The highest in rank in that country are disposed to estimate fully the importance of agriculture, and to consider it the most suitable employment when retiring from public life:—

"No direct aid has been given by the General Government to the improvement of agriculture, except by the expenditure of small sums for the collection and publication of agriculture statistics, and for some chemical analyses, which have been, thus far, paid for out of the patent fund. This aid is, in my opinion, wholly inadequate. To give to this leading branch of American industry the encouragement which it merits, I respectfully recommend the establishment of an Agricultural bureau, to be connected with the Department of the Interior. To elevate the social condition of the agriculturist, to increase his prosperity, and to extend his means of usefulness to his country, by multiplying his sources of information, should be the study of every statesman, and a primary object with every legislator."

We copy the following article from the *Farmers' Herald*, published in Chester, England, and we recommend it to the attention of Canadian Agriculturists.

The extension of railways to almost every district in the United Kingdom, gives the farmer an opportunity of inspecting at a trifling expense, and a little loss of time, the various improvements in agriculture which have of late years been introduced into several counties; model farms, newly invented implements at work in the fields, improved breeds of cattle and stock, &c., may all be viewed with profit and advantage.

The agriculturists, as a class, are prejudiced, to a great extent, against novel and theoretical systems which may be advocated in works on farming, and, consequently, they oppose any innovation upon their former practises and views, and continue in the same position in knowledge of agricultural matters as their forefathers. We would, therefore, urge upon them the desirableness of their taking advantage of the expedition and cheapness in travelling, which railways present, and beholding for themselves, the great advancement in agriculture which has been effected in those counties which are distinguished for good farming.

It is with pleasure we notice the following just observations of Mr. Hewitt Davis upon the subject, which appears in a contemporary:—"It has hitherto been a sad hindrance to advancement, that farmers have had little knowledge of the farming practised fifty miles from their homes; and hence it is that the traveller finds himself, in a few hours, transported, as it were, into a fresh country, so different are the stock, implements, and habits, and so conflicting are the principles which are to be found in English farming. But all Britain now lies open to the enquiring agriculturist, as an illustrated book of information, as an example farm for his improvement—and what a ready means is here for his acquiring improvement!—What a lesson might the raisers of stock in the west of Britain gain as to the finishing of stock and the value of root crops fed with oil-cake, by crossing and visiting the highly farmed districts in Norfolk and Suffolk! They might there see the

practise that enables the Norfolk farmer to pay 30s. an acre for comparatively poor sands, and that gives to them in six months the returns for their stock that the breeder scarcely realises in twice the period.

Farming, to be worth pursuit in these days, must be made a business, a business, too, conducted on sound principles, with the closest regard to economy, as well as of money, time and power. A farmer must consider himself to be a manufacturer, and his great aim must be to produce the largest possible quantity of his ware at the smallest possible cost, availing himself, to do this, of the best manures and the best machines which he can procure. Unquestionably, the application of scientific principles to agricultural operations is a distinguishing and important characteristic of the age. If science confers her blessings on agriculturists, art is not behind-hand in the distribution of its advantages. Every invention or improvement that tends to lessen manual labour, economise time, and introduce a better system of culture, ought to be hailed as a boon, first to the farmer himself, and through him to the public. Time and teaching are gradually unrooting old prejudices, and the efforts of science have happily, in our day, brought to bear upon the landed interest the acquaintance with many things which those of the past generation neglected or despised—have elevated agriculture into one of the most pleasing pursuits. A knowledge of chemistry is no longer despised by the farmer, as agricultural societies are now established in every part of the Empire; chemistry has become familiar to nearly all good farmers, who employ it in analyzing the various ingredients of soils and their combinations, and every science is greatly encouraged that can facilitate the cultivation and improvements of the soil.

ON FOOD FOR PIGS.

There is perhaps no notion more popular than that anything is good enough for pigs: raw or boiled milk, meat, grease, grain, roots, leaves, acorns, &c.

That the pigs eat various kinds of food is a very important point in rural economy; but there are certain articles that require to be given with caution, and it is to these

that I beg leave to call your attention. I have dearly bought this piece of information by the loss of two pigs; and a neighbour of mine has lost a fine sow by the careless use of the same salt.

It is well known that saltpetre has the valuable property of removing the taint of turnip-taste from butter; and a small quantity put into the churn with the cream renders the butter sweet and pleasant. In one case, the butter from one cow was made twice a week; and to this quantity about a teaspoonful of saltpetre was added, and the buttermilk given to the pigs (about two months old), after drinking the buttermilk, were very uncomfortable, and as little notice was taken of the affair, they got over it as best they might: however, it was not so on the next day of churning, for both pigs were taken violently ill, vomiting and purging; and when all hopes of saving their lives were gone, they were put out of pain by killing.

A veterinary surgeon, to whom I mentioned the circumstance, seemed astonished at the effects produced by so small a dose.

My neighbour's sow was poisoned by the saltpetre in a solution of salt and water for pickling meat. He was advised to give the sow salt and water for some trifling ailment, and this brine being ready, he gave her that, and the effect was immediate death.

Therefore, through the medium of your valuable paper, you will do well to warn your readers against using saltpetre in either food or medicine for pigs.

There is another article of food that requires to be used with caution; it is the Jerusalem artichoke, a most valuable vegetable when properly grown and cooked, but it is necessary to cook it in a good supply of water, and do not use any of the water in which it is cooked in any way either for man or for beast; it is consequently, unsuited for soups, unless first boiled and strained, and if the liquor is given to pigs, it scours them and disorders the stomach. Common sense dictates that potatoes should never be put into any broth or soup in a raw state, but should first be cooked and dried, and then compounded with other articles of food as required, for the liquor in which potatoes are cooked is not altogether harmless; although weakened by dilution, still the poison pecu-

liar to the tribe of solanacea exists, for it is not so volatile as to be driven off by heat as many suppose, but may be readily discovered by the sight and by the smell without any complicated chemical tests.

An instance occurred of a person of my acquaintance, when potatoes were scarce, using Jerusalem artichokes plain boiled, and they answered so well as a dish that he determined to experiment upon them, and made hodge-podge with plenty of these fine white tubers in it, and it had nearly proved fatal to one young man who ate heartily of it.

However, when the surgeon was sent for, and had made enquiry into the dietary, he found that his patient was suffering from artichoke liquor; and as the surgeon's pig had only just recovered from a similar complaint, caused by the boy that fed it having given the liquor, as well as the boiled vegetable, to it, he said he knew the complaint, but did not state the name or the standing of the patient that he had prescribed for, whilst suffering from a similar illness.—*An Old Gardener, but a Young Farmer.*

NORMAL SCHOOLS FOR RURAL DISTRICTS.

A well-digested system of agricultural teaching, embracing a whole district. I do not allude to the higher and more refined branches of agricultural chemistry, as these would be out of place in such a rudimental state of society; but I mean the best method of cultivating small farms, the raising of green crops, the husbandry of manure, house-feeding cattle, and other points of rural economy, which are essential to the successful culture of a croft. These we can never hope to inculcate by mere precept; we must have an example before the eyes of the people, and in a locality subject to the same peculiarities of soil and climate as their own land.

It has been objected that it is impolitic or impossible to teach children both book learning and practical agriculture by the same master, and that it would in consequence be useless to make parish schoolmasters agriculturists, for the purpose of instructing their boys in farming; but those who thus object do not know how well such combined teaching has already worked, nor do they consider that a change of occupation during

the day's instruction enables a boy to apply himself with much more vigour to each branch of knowledge.

I propose that a model farm, or normal school, for the instruction of such persons, shall consist of 45 acres, to be divided into three crofts, in the centre of which a residence for the superintendent and his pupils, might be erected. On each croft the necessary byre and houses should be built, tanks, and all other appliances for the most rigid economy of manure, and its best application to the land; means of house-feeding cattle, and other "desiderata," for the most economical farming, must be provided. The pupils should, with their own hands, cultivate these crofts, and a system of rewards be given to the distinguished of them. The cost of such an establishment, even at the first, would be small; and, in less than two years, it would become self-supporting, for the produce of the 45 acres, would not only feed the superintendent and his pupils, but would also contribute to, if not entirely defray, the expense of his salary.

The school should be in some central place easy of access.

DISEASED POTATOES.—A correspondent of the *Agricultural Journal* for Rhenish Prussia, recommends piercing the potatoes to be used for seed with a wooden instrument (the holes to be two or three in number and to reach the centre,) and then soaking them in water containing from two to three per cent. of sulphuric acid (oil of vitriol.) He supposes the infectious matter thus destroyed. He advises also plucking the blossoms to prevent infection from other fields, and planting deeper, inasmuch as it has been observed that the potatoes nearest the surface are generally most diseased. He professes thus to have raised potatoes, almost without exception, sound, while alternate hills, not thus treated, were very much diseased. John Flock, of Montabour, Nassau, has recently published the following method as a specific against the rot. He leaves rather larger intervals than is usual between the hills. When the plant has reached a convenient size, he hoes up the earth against it on one side, to one-half its height, then bends the plant over horizontally, and forms the hill so that an inch or two of the plant

projects from the middle of the slope. The plant on further growth makes an angle at this point. The object of the contrivance is to lead off the rain, which otherwise follows the stalk to the roots, and carries with it the matter which causes the disease in the tubers. This view of the progress of the disease, acquires probability from the fact that after rain, potatoes before sound often become diseased and rot rapidly—again, from the fact that the disease commences on the outside of the tuber, and is worse nearest the surface of the ground; further, from two observations of Mr. Flock, that suggested his method, namely, that there was always most disease in the hills whose plants grew straightest, and consequently, through the influence of the wind, formed a funnel-shaped opening about the roots, which gave the rain easy access; again, that where manure was applied in such a form and manner as to protect the roots in a degree from the rain, there was always least disease.

NEW CLEANSER FOR FLOURING MILLS.—

Mr. E. R. Benton, a millwright of Millwaukie, has invented a highly ingenious machine, to which he gives the above name. It is for the purpose of taking the bran as it comes from the bolt, and cleaning it of the flour which adheres to it, and which, without the adoption of some such process, is wasted, and also for separating bran and shorts. The machine is in the form of an upright cylinder, about four feet high and two feet across, within which are two revolving cylinders, curiously fitted up with wire cloths of various fineness, perforated sheet-iron plates, &c. &c. The bran is brought by an elevator to the top of the cylinder, and passes through a shaken sieve, which throws out the large lumps, that might clog the machine, down among the revolving cylinders. A current of air is driven up from beneath into the centre of the cylinder, inside the revolving part, and, by the operation of this current of air and the revolving of the mechanism, the bran, shorts, and two kinds of flour are passed off into separate receivers. The coarser flour is passed back into the elevator to go through the machine again, and the fine passes down into the bolt. A hammer constantly raps on the top of the revolving sieves to keep

them clear from being clogged up. About one-eighth of the mixed stuff, as it comes from the bolt to the machine, is saved as fine flour; and that in the very best mills three and a half per cent. of the flour ground will be saved; more, of course, in mills less perfectly built.—*Buffalo Commercial Advertiser.*

BEST METHOD OF FATTENING LAMBS,—

Separate the lambs from their dams, and keep them in a clean, warm, and well-ventilated house; quietness and darkness are essential to quick fattening, except when the dams are admitted for suckling, when the light must be partially admitted, which is about three times a day, the ewes being left with them all night. Should the ewes not have a sufficient supply of milk, it must be made up by fresh cows' milk. Some feeders rear the lambs entirely on cows' milk, given fresh from the cow, and, at the mid-day feeds, warmed to blood heat. The best thing to litter them with is clean wheat straw, some of which should be put in a rack, with the ears hanging out, to amuse them, and keep them from sucking each other's wool, collections of which in the stomach destroy many lambs; place some dry chalk, in lumps and in powder, which they may lick to prevent looseness. Some feeders add fresh eggs and finely-ground oatmeal, but the flesh is not thought so fair if fed on anything but sheep's or cows' milk.

HOW TO DESTROY RATS AND MICE.—Melt hogs' lard in a bottle plunged in water, heated to about 150 degrees of Fahrenheit; introduce into it half an ounce of phosphorus for every pound of lard; then add a pint of proof spirit or whisky; cork the bottle firmly after its contents have been heated to 150 degrees, taking it at the same time out of the water, and agitate smartly till the phosphorus becomes uniformly diffused, forming a milky-looking liquid. This liquid, being cooled, will afford a white compound of phosphorus and lard, from which the spirit spontaneously separates, and may be poured off to be used again, for none of it enters into the combination, but it merely serves to comminute the phosphorus, and diffuse it in very fine particles through the

lard. This compound, on being warmed very gently, may be poured out into a mixture of wheat flour, and sugar incorporated therewith, and then flavoured with oil of rhodium, or not, at pleasure. The flavour may be varied with oil of anniseed, &c. This dough, being made into pellets, is to be laid in rat holes. By its luminousness in the dark, it attracts their notice, and being agreeable to their palates and noses, it is readily eaten, and proves certainly fatal. They soon are seen issuing from their lurking-places, to seek for water to quench their burning thirst and bowels, and they commonly die near the water. They continue to eat it as long as it is offered to them, without being deterred by the fate of their fellows, as is known to be the case with arsenical doses.

MODE OF TREATING THE STING OF THE BEE.—As a sting may, perhaps, at one time or other, be received, I will subjoin Mr. Payne's remedy, in his own words—one which I have tried with complete success:—I pull out the sting as soon as possible, and take a piece of iron and heat it, or, for want of that, a live coal (if of wood the better, because it lasts longer), and hold it as near to the place as I can possibly endure it for five minutes. If, from this application, a sensation of heat should be occasioned, a little oil of turpentine, or Goulard cerate must be applied. But another certain and more simple remedy consists in the immediate application of *liquor potassæ* to the spot, to neutralise the acid of the sting. It should be used in small quantity, on the point of a needle or fine-nibbed pen, introduced into the wound. In the absence of this, *pure liquid ammonia* is said, on good authority, to succeed, if properly applied. Keep it in a close-stopped, small-necked bottle, which should be turned bottom upwards, and held very tight over the part. But any remedy to be effectual must be speedily resorted to; and particularly in the summer, for then the poison is much more active than in cold weather.—*Taylor's Bee-keeper's Manual.*

TO CORRECT ACIDITY IN BEER OR CIDER.—Take 4lbs. of calcined chalk, and put it into a 100 gallon cask; in a week the liquor will have become mild and pleasant.

AMOUNT OF MINERAL MATTER ASSIMILATED BY VARIOUS CROPS.—It is found, on analysis, that an acre of wheat, being an average crop, carries off with it no less than 210 lbs of inorganic elements, viz:—30 lbs in the grain, and 180 lbs in the straw—a striking proof of the importance of consuming the straw upon the land. Barley takes off 213 lbs—53 in the grain, and 160 in the straw. Oats takes 326 lbs—32 in the grain, 30 in the husks, 54 in the chaff, and 200 in the straw.

HEALTH.—A FEW WORDS OF COMMON SENSE.—Take, for example a young girl, bred delicately in town, shut up in a nursery in her childhood—in a boarding-school through her youth—never accustomed to either air or exercise, two things that the law of God makes essential to health. She marries; her strength is inadequate to the demands upon it. Her beauty fades early. She languishes through the hard offices of giving birth to children, suckling, and watching over them, and dies early; and her acquaintances lamentingly exclaim, “What a strange Providence that a mother should be taken in the midst of life from her children!” Was it Providence? No. Providence has assigned her three score years and ten—a term long enough to rear her children, and see her children’s children; but she did not obey the laws on which life depends, and, of course, she lost it. A father, too, is cut off in the midst of his days. He is a useful and distinguished citizen, and eminent in his profession. A general buzz rizes on every side of “What a striking Providence!” This man has been in the habit of studying half the night, of passing his days in his office and in the courts, of eating luxurious dinners, and drinking various wines. He has every day violated the laws on which health depends. Did Providence cut him off? The evil rarely ends here. The diseases of the father are often transmitted; and a feeble mother rarely leaves behind her vigorous children. It has been customary, in some cities, for young ladies to walk in thin shoes and delicate stockings in mid-winter. A healthy blooming young girl, thus dressed in violation of Heaven’s laws, pays the penalty; a checked circulation, cold, fever, and death. “What a sad Providence!” exclaim her friends. Was it Providence, or her own folly? A beautiful young bride goes, night after night, to parties made in honour of her marriage. She has a slightly sore throat, perhaps, and the weather is inclement; but she must wear her neck and arms bare, for who ever saw a bride with a close evening dress? She is seized with in-

flammation of the lungs, and dies before her bridal days are over. “What a Providence!” exclaims the world, “cut off in the midst of happiness and hope!” Alas! did she not cut the thread of life herself? A girl in the country, exposed to our changeful climate, gets a new bonnet, instead of getting a flannel garment. Arheumatism is the consequence. Should the girl sit down tranquilly with the idea that Providence has sent the rheumatism upon her, or should she charge it on her vanity, and avoid the folly in future? Look, my friends, at the mass of diseases that are incurred by intemperance in eating or drinking, or in study, or in business; by neglect of exercise, cleanliness, pure air; by indiscreet dressing, tight lacing, &c.; and all is quietly imputed to Providence. Is there not impiety, as well as ignorance, in this? Were the physical laws strictly observed from generation to generation, there would be an end to the frightful diseases that cut short life, and of long maladies that make life a torment or a trial. It is the opinion of those who best understand the physical system, that this wonderful machine, the body, this “goodly temple,” would gradually decay, and men would die, as a few now do die, as if falling to sleep.—*Mrs. Sedgwick.*

We extract the following from the second edition of Stephen’s Book of the Farm, who, in turn, quotes from Mr. M’Turk, of Hastingshall, Dumfriesshire:—“When intended for bratting hogs, the cloth should be three-quarters wide, and two feet will be sufficient to cover one black-faced hogg. When intended for old sheep of the best description, the brats may be made larger by applying the cloth the long way, and we have then 27 inches in width to cover the back and sides instead of 24, and it can be cut off as long as the largest sheep requires. The brat should come so far down the sides as to cover the widest part of the ribs and all the back, from the tail to the back of the neck. Instead of fitting the cloth to every sheep, the best plan is to select a sheep of the average size of the class, and measure and cut the quantity of cloth required. When the cloth has been applied to the animal, and its proper dimensions ascertained, the parts should then be marked to which the different straps and strings are to be sewed, to hold it in its proper place. A strap is fixed to one of the front corners, in a direction to pass beneath the throat, and be sowed to the other corner; and other straps are intended to pass under the belly. These straps are only sowed at first at one end, and the other end is sowed after the brat is fitted on, so as to keep it tight in its place. The straps should be of a soft material, that they may not chafe or injure the skin when the

sheep is moving about. When made, the brats are dipped in coal tar, the better to resist the wet and rotting, and if taken care of will last, thus prepared, for five seasons. They ought to be made early in summer, to have time to be dried before November, when they are used. They remain on the sheep, but not longer than the beginning or middle of April, according to the state of the weather, and the condition of the flock. A person accustomed to the use of the needle, can make a brat in five minutes, and fit it on in less than other five." Mr. Stephens suggests the propriety of rendering the woollen cloth waterproof, and making the strings of vulcanized Indian-rubber, which, by yielding to the motions of the animal, will keep the brat always secure, and, at the same time, will not chafe or injure its skin. Tar and soap, or linseed oil and soap boiled, will suit for calico, and render it impervious for a time. These materials are to be had in all wholesale or retail druggists, and general country shops; but we may remark here that the cloth should be prepared during the summer, as the preparation takes a long time to dry.

THE BOTTLE TRICK PERFORMED BEFORE THE QUEEN.—On Monday (Prince Albert's birthday), during the festivities at Balmoral, the Wizard of the North (Professor Anderson) was present, and was asked if he would perform the feat they had heard so much of his having done so successfully—"The Inexhaustible Bottle." On receiving the royal command to perform it, he called for a champagne bottle, and handed a large number of glasses round, and asked Lord Portman what he would drink. His lordship replied "Whisky." Whisky was poured out. Mr. Anson preferred brandy, which he got. Several demanded wine, which passed freely; and one of the proprietors of the royal distillery, Mr. Begg, thinking to baffle the Professor, asked him if he could give him a glass of his best Lochnagar whisky. No sooner said than done; and the Lochnagar whisky became in great demand. A large number of additional glasses were distributed, and some called for Irish whisky, numbers brandy—the Highlanders patronised Mr. Begg; when Lord J. Russell, perhaps like Mr. Begg, wishing to try the Wizard's skill, asked for a glass of rum, which was immediately supplied, and his lordship pronounced it excellent. The London portion of the domestics and police called for gin, which was freely poured out of this extraordinary bottle; and the Wizard was returning to his state, when his Royal Highness, anxious to test the bottle—presuming, as he was returning, that it was exhausted—asked if more could be poured out. Glasses were brought for her Majesty and Prince Albert, and on being asked what they preferred,

requested Begg's best Lochnagar, which immediately ran forth, and her Majesty and the Prince tasting it, acknowledged its purity; and the Wizard gave the bottle to the Prince, and asked him to look if it was empty; it was. Mr. Anderson brought some water, and in the Prince's hand, filled it, ordered glasses, and asked the Prince what wine he preferred. Port was selected. The Prince poured port, and then sherry, then milk, then champagne, then broke the bottle, and in it was discovered a beautiful turtle dove.

NORWEGIAN WINTER TRAVELLING DRESS.—As there had been much frost, during the night, we were, on the following morning, advised not to continue our travel in a cabriolet, but in sledges. We were assured that there had been sufficient snow and frost on the table-land to admit of this manner of travelling safely, which was much better adapted for the road than wheeled vehicles. The frost had continued for several days, and the ice on the lakes and water-courses was said to be strong enough to bear the horses and sledge. Having consented to this change, an addition to our clothing was next proposed; our dress being observed not to be of such a description as to protect us sufficiently against the inclemency of the weather, which, at this season, prevails on the table-land. Our experience of yesterday gave weight to the arguments of our landlord, but the equipment proposed appeared to us at first so strange, that it was only after some hesitation that we were induced to adopt it.—We had to put over our boots another pair made of sheepskin, and over our heads a large cap made of the same material; the latter was provided with two lappets, of which one was tied under the chin, and the other under the nose, and extended over our foreheads to the eye-brows, so that nothing was uncovered except the eyes themselves. Our hands were not forgotten. We were obliged to put on a pair of gloves of immense size. They were also made of sheepskin, and so large that they reached over the elbows nearly to the shoulders, and they were tied together by a thong on our backs. Having in this way secured the extremities from the effects of the cold, the whole equipment was completed by a large wolfskin tied round our bodies.—When we were thus fully arrayed, we could not help laughing at each other, for we appeared to have entirely lost the shape of human beings. We certainly much more resembled the Esquimaux, in the full Winter dress, than any person living on our happy island.—*Wittich's Visit to the Western Coast of Norway.*

The communication of "A New Subscriber" in our next.

I'M OF THE BAND THAT TILL THE LAND.

BY JAMES STARKEY.

I'm of the band that till the land,
And draw from the earth her store;
Right happy indeed's the life we lead,
While our days are passing o'er.
Many there are, in riches far
Surpassing the farmer's purse,
While other pursuits may yield more fruits,
Yet often bring forth much worse.

We envy not the statesman's lot,
Still clamouring for his class;
Nor his that fights for glory's rights,
At some redoubted Pass.
No risks have we on boisterous sea,
Nor fears lest tempests whelm
All we possess, without redress,
While labouring at the helm.

The fruitful field its bounties yield
A rich reward for toil;
Be ours the trade to ply the spade,
And deeply plough the soil.
We walk abroad o'er carpet sod,
And flowrets kiss our feet,
Whose odours rise to scent the skies—
A tribute pure and meet.

To all we give the means to live,
As brother shares with brother,
And thus fulfil the holy will
That bids us "love each other,"
Oh! life secure from guile, and pure!
To thee my soul clings ever,
With all its might, in fond delight,
To change from thee, no, never.

CANADIAN GLASS MANUFACTORY,

NEAR SNYDER'S LANDING, VAUDREUIL,

*Erected and carried on by Messrs. Boden
& Le Bert.*

THE Proprietors of this establishment are prepared to Manufacture LOOKING GLASS PLATE and WINDOW GLASS, of every size, coloured and fancy, according to patterns or orders. Shades for Oil and Gas Lamps, plain, tinted, or coloured, in the richest hues—Coloured Glass of any pattern for Churches, similar to those of European Churches; also, for Cottages, Gardens, Houses, and Steamers—Bottles and Vials for Druggists made to order.

—ALSO,—

SODA, GINGER, and ROOT BEER BOTTLES, with or without the maker's name.

—AND,—

MILK PANS, of suitable sizes.

All these articles shall be of the very best quality, and disposed of on reasonable terms; and the Proprietors solicit a share of Public patronage, and the examination of their Manufactures.

For orders or further particulars enquire of the Proprietor, at the People's Hotel, No. 205 and 207 Notre Dame Street, Montreal.

Vaudreuil, January, 1850.

FARMING IMPLEMENTS.

WE, the undersigned, certify that we have carefully inspected a variety of Farming Implements manufactured by Mr. A. Fleck of St. Peter Street, and we feel great pleasure in recording our unqualified opinion that they are very much superior to any article of the kind which we have seen manufactured in the country, and equal to any imported.

And we would particularly recommend to the notice of Agriculturists throughout the Province his Subsoil Grubber, which he has improved upon from one which took a premium of £10 from the Highland Society of Scotland. This implement seems well adapted to improve and facilitate the labours of the Farmer, and we cannot doubt that it will soon be extensively used in improved cultivation. His Scotch and Drill Ploughs are also very superior, and well worthy of the inspection of every one desirous of possessing a valuable article.

M. J. HAYS, Cote St. Antoine,

President M. C. Agricultural Society.

P. P. LACHAPPELLE, Sault au Recollet.

WM. EVANS, Sec. L. C. Ag. Society.

JAMES SOMERVILLE, Lachine.

EDWARD QUINN, Long Point.

T. E. CAMPBELL, Major, Civil Secretary.

HUGH BRODIE, Cote St. Pierre.

P. F. MASSON, Vaudreuil.

JAMES ALLAN, Pointe aux Trembles.

GEORGE CROSS, Durham.

AUCTION SALE OF FRUIT TREES, &c.

THE undersigned is authorised by the Proprietor of ROSEBANK NURSERY to state, that, as early after the opening of the navigation in spring as possible, there will be a Sale by Auction, in this City, (similar to that which took place this fall) of

Apple Trees, a fine assortment of suitable named sorts.

Pear	do	do	do	do
Plum	do	do	do	do
Cherry	do	do	do	do

TOGETHER WITH

Raspberry Bushes, Strawberry Plants of fine named sorts, Roses, and various Ornamental Trees and Shrubs.

The healthy condition of these Trees and Plants, and the accuracy of their names, may be depended upon, and the sale will take place in good time for subsequent spring planting, which is the safest, at any rate, in all northern climates.

JOHN DOUGALL,

Montreal Witness Office,...

Agent for Rosebank Nursery.

Montreal, November 30, 1849.

REAPING MACHINES.

THE Subscriber has on hand three REAPING MACHINES of the latest and most improved construction, capable of cutting twenty-two acres per day. Being manufactured by him, self, he is prepared to warrant both material and workmanship as of the best order. PRICE—MODERATE.

MATTHEW MOODY, Manufacturer.

Terrebonne, July, 1848.

FLOWERS AND FLOWERING SHRUBS.

FOR SALE at ROSEBANK NURSERY, near Amherstburgh, Flowers and Flowering Shrubs, consisting of the largest collection of choice named Tulips, on this Continent, at very reduced rates. A very fine collection of Double and Single named Hyacinths, of all colours and shades. A large assortment of choice new Dahlias, Roses, comprising many of the finest varieties of Hardy June, Moss Bourbon, Perpetual, Hybrid, Noisette, Bouxsalt, Bengal, and Tea Roses, &c., &c., at very low prices. Poenias—Tree and Herbaceous, as well as nearly all the choicest flowering shrubs, and Perennial Flowers, Bulbus and Herbaceous, can be supplied. Flower seeds, of the best kind, for sale. Orders by mail, or left at the *Witness Office*, Montreal, will be carefully attended to, and forwarded with despatch.

JAMES DOUGALL.

November 30, 1849.

ROSEBANK NUSERIES.

NEAR AMHERSTBURGH, CANADA WEST.

THE PROPRIETOR has for Sale, a most extensive Assortment of FRUIT TREES, comprising all the desirable and leading varieties, and including all the kinds recommended as first-rate at the Pomological Conventions at Buffalo and New York, last Fall, Apples *a* 1s. 3d. each, or \$15 to \$20 per 100; and by the 1000 at very reduced rates.

Pears on Quince and free

Stocks..... *a* 2s 6d. ea., or \$40 per 100

Peaches, an unrivalled

assortment..... *a* 1s 3d ea., or \$20 doPlums, 74 varieties, *a* 2s 6d ea., or \$40 doCherries..... *a* 2s 6d ea., or \$40 doNectarines..... *a* 1s 10½d each

Apricots on Plum and Apricot

Stocks..... 2s 6d each.

Quinces..... 1s 3d to 1s 10½d each.

Foreign Grapes..... 2s 6d ea., 22s.6d per doz

Native do, 1s 10½d ea., 15s do

Gooseberries..... 1s each, 10s do

utsCrran and Raspberries, Strawberries, Almdnos Chesnuts, Filberts, Mulberries, &c., of all the best kinds, and at very reduced rates

Specimen Trees of every variety cultivated have been planted out, which are mostly in a bearing state, and from which the scions have been cut, offering a guarantee for the accuracy of the kinds, which few nurseries possess; in evidence of which the Proprietor received the first premium for Foreign Fruits at the New York State Fair at Buffalo, as also nearly all the first premiums at the Detroit Horticultural Society's Exhibition, during the season.

Persons unacquainted with fruits would be better supplied, both as regards size of trees and quality of fruits, by leaving the selection of varieties to the Subscriber, merely mentioning the number of Summer, Autumn, and Winter varieties required, and any other instructions they may think requisite as to size of fruit, &c.

The Trees will be carefully packed, so as to carry any distance with perfect safety, a small extra charge made for packing. Orders should be sent by 1st March, so as to ensure a good selection being got, and also that they may be forwarded by the first conveyance.

The Propeller EARL CATHCART plies regularly between Amherstburgh and Montreal, touching at the intermediate ports.

Trees, when taken up early, can be safely planted any time in April or May.

Orders may be left at the *Witness Office*, Montreal. JAMES DOUGALL, Proprietor.

Rosebank Nurseries, near Amherstburgh,
20th November, 1849.

NEW SEED STORE.

THE Subscriber begs to acquaint his Friends and Customers that he has, under the patronage of the Lower Canada Agricultural Society,

OPENED HIS SEED STORE,

At No. 25, *Notre Dame Street*, Opposite the *City Hall*, Where he will keep an extensive assortment of AGRICULTURAL and GARDEN SEEDS and PLANTS of the best quality, which he will dispose of on as favourable terms as any person in the Trade. From his obtaining a large portion of his Seeds from Lawson & Sons, of Edinburgh, who are Seedsmen to the Highland and Agricultural Society of Scotland, he expects to be able to give general satisfaction to his Patrons and Customers. He has also made arrangements for the exhibition of samples of Grain, &c., for Members of the Society, on much the same principle as the Corn Exchanges in the British Isles. He has a large variety of Cabbage Plants, raised from French seed, which he will dispose of to Members of the Society, at one fourth less than to other customers.

GEORGE SHEPHERD.

Montreal, April, 1849.

Agents for the Agricultural Journal.

Mr. J. B. Bourque.....	St. Damas.
Dr. Conoquy.....	St. Cesaire.
Dr. De la Brûère.....	St. Hyacinthe.
Mr. Cadeaux.....	St. Simon.
Mr. T. Dwyer.....	St. Pauls, Abbotsford.
Mr. Gendreau, J.P.....	St. Pie.
Mr. Blanchet.....	La Presentation.
Paul Bertrand, Esq., N.P.....	St. Matthias.
Charles Schaffer, Esq., N. P.....	Chambly.
M. Cordillier, Esq.....	St. Hilaire.
Thos. Cary, Esq., (Mercury)...	Quebec.
Dr. Smallwood.....	St. Martin, Isle Jesus.
Robt. Ritchie, Esq.....	Bytown.
Major Barron.....	Lachute.
The Editor of the Star.....	Woodstock, C. W.
L. Guillet, Esq.,	Three Rivers.
D. Dubé.....	Isle Veite.
Azarie Archambault, N. P.....	Verannes.
Hon. F. A. Malhiot.....	Verchères.
J. B. E. Durocher, Esq.....	St. Charles, Chambly.
A. C. Cartier, N. P.....	St. Antoine.
André Vendendaïque.....	Belœil.
John M'Larren, Esq.....	Murray Bay, Sag.

All communications connected with this Journal, to be addressed, post paid, to the Secretary of the Society—WILLIAM EVANS, Montreal.

Annual Subscription for the Journal, five shillings.

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AGRICULTURAL JOURNAL,

AND

TRANSACTIONS

OF THE

Lower Canada Agricultural Society.

VOL. 2.

MONTREAL, FEBRUARY, 1860.

NO. 2.

The Lower Canada Agricultural Society, although they have not had a Cattle Show, or other Exhibition, are entitled to the credit of having effected much good by the circulation of their Journal to all parts of Lower Canada. There is unquestionable proof of the fact, in the hands of the Society, that the Journal has created a considerable interest in most sections of the country, for the improvement of agriculture, and this interest could scarcely have been created by any other means. They have, in the next place, through their seedsman, Mr. George Shepherd, had a large quantity of agricultural seeds of the best quality, imported, and sold at first cost prices, as the Provincial duties were not charged upon them. These seeds consisted of seven thousand pounds weight of clover, from England, France and Holland, white clover, mangel wurtzel, Swedish and other turnip seeds, carrots, parsnips, cabbages, &c. These seeds have been disposed of to members of the Lower Canada Agricultural Society, to County Societies, and to farmers from all parts of the country, who, we believe, are well pleased with the results obtained from the seeds sown. The great advantage of European clover-seeds is, that it does not come to maturity so early as the American clover-seed, and will not be fit to cut before the timothy is fit for the scythe. We have constantly seen the clover grown from American or Canadian seed, ripen much in advance of the timothy, particularly in light, dry soils, and dry seasons. This is a considerable loss, as the clover loses some of its best qualities when the flowers and leaves drop

off before they can be taken to the barn. The Feltearn variety of Swedish turnips are considered a very superior variety, and the seed cost nearly double the price of any other purple top Swedish turnip-seed. Of this seed a considerable quantity was imported and sold, and has given full satisfaction, we are told, to those who purchased it. For the present year, a part of the supply of seeds has already arrived at New York, and will be in Montreal as soon as the navigation opens in spring. John Dodds, Esq., of Petite Côte, has ordered a large quantity of the Feltearn and Skirving's purple top Swedish turnip-seeds from one of the first growers in Scotland, for the seedsman of the Society. Seven thousand pounds of red clover, and one thousand pounds of white clover, have also been ordered from the long established house of Van Eaden & Co., Haarlem, Holland, which will be for sale at reduced prices, as last year. It would be very desirable that farmers who purchased any of the clover-seeds sold by the seedsman of the Society, last year, should acquaint us with the result, and their opinions of the clovers. We have further to state, that in any parish where there are twenty-five subscribers to the Agricultural Journal, or as members of the Lower Canada Agricultural Society, twenty packages of garden seeds, sufficient to sow half an acre, shall be placed at the disposal of the clergyman of the parish for distribution to the most indigent of the parishioners, whose circumstances might preclude the possibility of their purchasing those seeds for themselves. The seed to consist of French early cabbage, do. late Quintal do., choal

rabbi, turnip-rooted cabbage, purple top turnip, beet-root, carrot, parsnip, onion, and lettuces. These seeds to be given to the parishes entitled to them, on application by the clergyman to the seedsman of the Society, and we shall give the names of the several parishes in the March number of the Journal. If the parishes obtaining these seeds were to offer a few small premiums to those poor persons who might receive them, for the best produce raised from the seed, we think it would have a very beneficial effect, and encourage industry amongst the poorest classes, and where it is most required. If the successful competitors' names should be reported to us, we shall give them in the Journal. With such a favourable climate and soil as we have for gardening, a family might, by industry, raise a quantity of vegetables in even a small garden, that would greatly assist them, and the necessary work need not interfere much with their occupations. Manure might also be found very readily, by making a compost of all the wastes of the house and family, ashes, &c., mixed up with road scrapings and other waste earth. Liquid manure applied during the summer would also have an excellent effect, and could be easily collected. We strongly recommend this matter to consideration. The cause of offering the distribution of these seeds gratuitously to parishes, where there are twenty-five subscribers to the Society or their Journal, is, that in such parishes there is an evident interest felt in the object which the Society are so anxious to promote, namely, the improvement of agriculture in Lower Canada.

We are obliged to Mr. William Boa for his communication over his own signature respecting his system of farming. We know Mr. Boa to be an excellent practical farmer, and have seen his farm constantly from his first purchase of it. We shall be glad to hear from him whenever he is disposed to write upon subjects connected with agriculture. He has, we conceive, much to his credit, come boldly forward

to assist us to make this Journal useful. There are many other farmers might follow this good example, if they were so disposed, but they do not appear inclined to inform others of the good systems they practice, or the results of any particular cultivation or management they may have adopted in their practice. Others may be able to account for this, but we cannot.

To the Editor of the AGRICULTURAL JOURNAL.

VIRTUE ROADHEAD, January 22nd, 1850.

SIR,—I have been a practical farmer in Lower Canada for more than a quarter of a century; I am sorry to observe that although this is certainly an age of improvement, the Agriculture of this Province, during the last thirty years, has not advanced, but rather gone backwards; at least in that part of the country I am acquainted with, and in my own locality, which, as regards situation and soil, is not surpassed by any in the province, except the immediate precincts of a city, where manure can be had. Thirty years ago the pecuniary circumstances of the farmers were better, though farms produced more grain and kept more cattle than they have at present, except those farms that have come into the hands of British farmers, and perhaps some of their immediate neighbours. The French Canadian farmers at one time almost universally followed the same routine; this was alternate grain and pasture. The ravages of the wheat fly and the introduction of distilleries amongst us, had the effect of making them give up their old plan, and few of them have as yet found out or adopted any better plan, but have gone from bad to worse; the want of wheat for several years, and the high prices given by the distillers for other grain, induced them to put away most of their horned cattle, and plough with horses, that they might put more of their land under crops every year, thinking that by encouraging the manufacture of intoxicating drinks, they were filling their pockets by selling everything from the farm that it produced. Now, after many years trial, the balance side of the sheet turns out entirely in favour of the distillers. It was of no consequence to them, what price they paid for grain, as long as the country took the whiskey at the distiller's own price, whereas the farmer, in

sowing nearly the whole extent of his farm every year, has been carrying on a continual scourging of its soil, as there is no root or green crops, raised for the purpose of feeding, and the straw, as well as grain, in many instances, is sold; there is very little manure made on the farms—the results of such a course may easily be seen to be ruinous. If this system is necessary in any business it is particularly so in farming. A want of it amongst us, I think, is one of the greatest drawbacks on the development of the Agricultural resources of Eastern Canada. Now I conceive it to be the interest of all, and your especial province, to lay before the farmers of Lower Canada, some plan by which they might, by their own labour and industry, restore and maintain the fertility of their own exhausted farms, and as I fear there is little other capital amongst us, this end can only be attained by directing this labour into proper channels. With a view to this end I humbly submit to you a miniature plan of a small farm, with the rotation of crops, that has been strictly acted upon for the last ten years; you will perceive that the rotation comprehends the whole extent of the arable land on the farm, and of course it is all brought into and kept in a clean and productive condition; and I hesitate not to affirm that this system if carefully acted upon, would, in six years, more than treble the annual agricultural products of the country. The rotation is as follows:—No. 1, green crops or fallow: No. 2, wheat or barley: No. 3, hay: No. 4, pasture: No. 5, pasture: No. 6, oats and peas; and round again; the drawing represents the actual condition of the farm in the summer of 1849; any person looking upon it could scarcely miss the tracks. Some of the practical results of this system, with the comparative value of some of the crops, may perhaps, prove useful or interesting to some of the readers of the Journal; the cultivation of root or green crops, for the purpose of feeding, may be considered the material foundation of agricultural improvement, and for the two following very obvious reasons:—first, root or green crops cannot be raised at all, but with good tillage and the complete destruction of weeds; secondly, all the broad leaved kinds are not great exhausters of the soil, and may be considered as a kind of reservoir, by which the

fertilizing elements of the atmosphere are collected and kept in the hands of the farmer, to be applied to the land at his discretion. I shall not enter on farther detail at present, except to show the results of the system on field No. 1. In the year 1842, I for the first time, (after French Canadian culture,) had this field ploughed, and sown, the one half with peas and the other with oats, but the land was so completely foul and exhausted, that the peas crop was not worth thrashing, the oats scarcely paid for reaping and thrashing; the year following it was cultivated under green crops and fallow, the whole manure made on the farm being applied to it. It has yielded good crops all round the course; 1849 brought it into the first stage of a second course, and has been cultivated under the following crops, the comparative value of which, I found, by measuring the land and weighing the produce, to be as follows, per arpent:—

	With Tops.			Without Tops.		
	tons.	cwts.	lbs.	tons.	cwts.	lbs.
Mangel wurzel, long red.	24	5	80	18	12	36
Carrots, red Albrongham	18	2	56	13	5	20
Turnips, white globe...	8	4	32	5	0	0
Swedish turnips	10	19	27	6	5	100
Potato-s, early white...				4	6	0

Horse beans, a failure, little more than twice the seed. Indian corn, cannot say exactly, as it is not all shelled yet, but I think between 50 and 60 minots per arpent.

I may here notice that I sowed a short red carrot, for which I have not got a name, but it was labeled large white Belgium; I sowed several rows of these through a field of red Albrongham for the purpose of proving the difference of their products; I raised the same length of two rows which grew side by side, and weighed them tops and roots, and found as follows: long 357 lbs, short 297 lbs, giving a balance of 50 lb. in favour of long without tops. I found of long 227 lbs., of short 230, giving a balance of 3 lb. in favour of short. I do not think I lost any thing by sowing the short carrot, but seedsmen ought to be cautioned against selling seeds, that are not true to their kind, or of a different kind to that which is ordered. I shall not attempt to give the money value of the above mentioned crops, as I believe the best market they can be brought to is to convert them into some exportable article on the farm, except where manure is easily got. I am not chemist enough to know the exact quantity of nutriment contained in the several

kinds. Neither can I positively say which is the best to cultivate as a preparation for the following crops of the course, as this will depend upon which is the least exhaustor of the soil; to arrive at any conclusion would require the experiment to be carried out through the whole course. One thing, however, appears very evident—that is, the propriety of cultivating as great a variety of crops as the soil will admit of; as seasons are not all alike, one kind may fail while others may yield abundantly, the failure will be little felt.

Now, Sir, I do not pretend that a six years rotation is adapted to every kind of soil; on a very light or sandy soil it may be necessary to extend it to 7 or 8 years and perhaps more, or on a naturally very rich soil it may be reduced to 5 or even 4 years, where manure can be got; but on a soil of medium capabilities, if depending on its own resources, less than six years rotation will not maintain its fertility.

If the contents of this paper should be considered worthy of a place in the Journal you may hear from me again. In the mean time I remain yours sincerely,

WILLIAM BOA.

To the Editor of the Lower Canada AGRICULTURAL JOURNAL.

SIR,—I was very glad to observe in your last Number the editorial allusions to the great benefit derivable from Lectures on Agriculture; and I would fain hope that the further agitation of so important and interesting a movement will not be allowed “to go to sleep,” but that something may yet be done towards carrying the suggestion into practical effect, in spite of every obstacle. Nay, I see no good reason why one who has done so much for the improvement of Canadian husbandry as *the worthy Secretary of the Lower Canada Agricultural Society*, should not at once set the example, and thus, forthwith, make a beginning in earnest. Let the fallow ground be once broken by him, and I have no doubt others will soon follow in the same furrow, and much good be the result.

Up then, Mr. Editor, and be doing. Take half a sheet of foolscap, and at once dash off as a heading,

“SPEED THE PLOUGH.”

“Programme of a Course of Lectures on Agricultural and Horticultural subjects, to be delivered in Montreal in the course of the present winter, in connection with the Provincial Agricultural and Montreal Horticultural Societies:

NO. OF LECTURES.	SUBJECT.	BY WHOM.	DATE.
1st Lecture,.....	Introductory,.....	(Say) Mr. A.	&c.
2nd do.	On Horticulture,.....	(Say) Mr. B.	&c.
3rd do.	Agricultural,.....	Mr. C.	&c.
4th do.	Horticultural,.....	Monsieur D.	&c.
&c.	&c.	&c.	&c.

And then look over your list of members and subscribers with an enquiring eye, and see whether, by taking staff in hand, and a little active peripatetic canvassing, you cannot pop upon at least five or six more out of “the whole bunch,” who will be willing to lend a helping hand in so good a cause. Surely there can be no room for utter despair when we see the slumbering, sleepy-headed Natural History Society beginning to shake off its discreditable lethargy, and threatening to inflict a course of interesting miscellaneous lectures upon us.—But stop; I

must not say a word more against that worthy, though sadly sluggish fraternity, as it may be advisable to beg the use of their waste Lecture Room to sow some agricultural seeds in; so it would not be right to put them too much out of humour.

Nor is this altogether a mere flourish of speech; for who knows but, for want of better, a friend of mine, who shall at present be nameless, may contribute his humble mite in some shape or other—whether as rake, grubbing hoe, or scarifier, it is hard to tell—rather than the thing should fall to the ground altogether. In the meantime, I beg to call your attention to the annexed article from a New Brunswick paper, indicative of their beginning to be “wide awake” there, as well as of the good likely to result from the scientific labours of our talented friend, Professor Johnston, in that quarter—and which, for certain reasons, ought to put us more favoured Canadians to the blush. And should that not be sufficient, though, God knows, no friend to *Annexation*, let me bring to the recollection of yourself and readers the following paragraph in a late Upper Canada paper, as a specimen of how they “learn” to go a-head in agricultural, as well as other matters in the neighbouring State of New York:—“OUR countryman, Professor Johnston, of Durham, is engaged to deliver a Course of Lectures on the general relations of Science and Agriculture, before the New YORK STATE AGRICULTURAL SOCIETY, commencing early in January.” Alas! for our boasted Patriotism!

After so long and perhaps too prosy a sermon, you will, I suspect, be rather glad than otherwise at my at last coming to a conclusion, by subscribing myself, at all events, your sincere well-wisher, and

Very obedient servant,

AN UPPER CANADA FARMER.

Montreal, 11th January, 1850.

The article above alluded to is as follows:—

LOWER PROVINCES.

MR. JOHNSTON'S LECTURE UPON THE AGRICULTURE AND CAPABILITIES OF NEW BRUNSWICK.—Mr. Johnston confirmed the statements which we have frequently heard respecting the capabilities of this Province as a farming country, and although in the estimation of some people

his average of crops were rather high, still the conclusions were decidedly in favor of our neglected capabilities, and even calculated to stimulate the drooping hopes of our farmers; all we want is perseverance, industry, and information. Mr. Johnston directed attention to one of the prominent causes of failure, viz.: the waste of time, which drags in its train many other wastes. He gave a convincing illustration that a judicious farmer may hire labor advantageously, viz.: the sovereigns exhibited by one man is a proof that all other things being equal, similar profits may be realized by others.

Mr. J. commenced his lecture with a brief review of the importance of a knowledge of geology in determining the agricultural capabilities of a country, showing that the qualities of soils were dependent upon the character of the rocks from which those soils were originally formed by the process of crumbling, or decomposition, effected by the agency of natural causes. He then alluded to the qualities of the different soils, which he estimated by the quantity of hay they gave per acre, the probable population and stock they would support, the relative amount and value of crops in New Brunswick, Canada, New York, and Ohio, showing a conclusion decidedly in favor of this Province. He stated also that the wheat of this Province, if properly manufactured, was equal to the best Genesee. He considered oats the staple, and adverted to the importance of erecting proper mills for the manufacture of oatmeal. He stated that the prices of produce proved that there was no want of markets, and alluded to some suggestions in his report upon the subject. He observed that notwithstanding the length and severity of our winters, farming could be followed with advantage. He stated that lumbering had been prejudicial to our agriculture, but nevertheless that New Brunswick had been benefited by it, showing an obvious truth that agriculture and lumbering are distinct pursuits, that the lumber trade is good in its place, an auxiliary, but not the principal, of our colonial prosperity.—*St. John paper.*

We have received from Professor Johnston a printed copy of “An address delivered at the annual exhibition of the New York State Agricultural Society, at Syracuse, September the 13th, 1849,” by that gentleman, for which we beg to return him thanks. This address refers chiefly to “The State of agriculture in Europe,” and appears to be an introduction to the Course of Lectures which he then proposed to deliver at Albany in the present month of January, and which we believe he is now

engaged in accomplishing at that place, before the New York State Agricultural Society. We wish it was in our power to be present to hear these lectures, but as it is not, we have applied to the professor to favour the Lower Canada Agricultural Society with a few copies of his lectures when they are published, as, no doubt they will be. The following are the subjects of the nine lectures proposed to be given:

1st. The relations of Physical Geography to Practical Agriculture.

2nd. The relation of Meteorology to Practical Agriculture.

3rd. The relation of Botany and Zoology to Practical Agriculture.

4th. General relations of Geology to Practical Agriculture.

5th. Relation of Chemistry to the soil, and its Practical improvements.

6th. Relations of Chemical Physiology to the Plant, and modes of promoting its growth.

7th. Relations of Chemical Physiology to the animal, its food and its growth.

8th. Relations of Chemistry to the Doctrine of Manures.

9th. Means by which general Scientific Knowledge may be diffused and made available to the improvement of Practical Agriculture, and the general elevation of the Agricultural class.

From the well established character of the learned and able Professor, there is no doubt his lectures will be highly interesting and instructive, and we would consider it a great privilege to have been present. The agriculturists of Canada may yet be favoured with an opportunity of hearing the Professor's lectures on agriculture. As we observed in a former number of this Journal, such a man as Professor Johnston, is able to do more for the advancement of agricultural improvement than ten thousand practical farmers, however good their practice upon their own farms, where very few except themselves will know any thing about their practice, or derive any advantage from it in the way of instruction in the science and art of agriculture. Professor Johnston devotes his time and mind to the study of his subject, and no man, perhaps, has had better opportunities of seeing the most perfect systems of husbandry in full operation, not

only in the British Isles but in other countries. He is, therefore, well qualified to instruct the very best practical farmers in many things that would be very useful to them to know, and which, with all their experience, they may be ignorant of. In our own experience, we have always seen that the best informed practical farmers were the most anxious to have further information on the subject of their profession, and availed themselves of every opportunity that offered to obtain further perfection in husbandry. We believe it is the same case in every other art and science, that those who know the most, are the most anxious to know more. The most certain discovery that is made by the best educated man is the very limited extent of his knowledge, compared with what might be known, if there was life granted for an opportunity to learn more. So with the man that knows most of practical agriculture, he feels every day that there are many parts of his practice that would require further experiment to enable him to attain a greater degree of perfection—and it is in this way that the great improvements in agriculture have been introduced up to the present time.

Extracts from Mr. Johnston's Lecture.

And now you are ready to ask me, what those, who in Europe are most in advance in the practice of the rural arts, look forward to as likely to help on agriculture still further. In what especially, you will enquire, do we of Great Britain trust, who have thrown down the gauntlet to the farmers of the world? These questions I shall answer by drawing your attention briefly, to what may be regarded as the characteristic or living feature of the agriculture of our time—what you no doubt expect me briefly to speak of, the direct applications, namely, of natural science to the several branches of rural economy.

The main purposes for which natural science are applied to rural economy, are—

First. To explain the means of practices already adopted, or of things already observed, and to supplant old and defective by new and better usages.

Second. To establish general principles, by means of which, a short cut is provided for the unlearned, to the knowledge, practical and theoretical, we already possess. A single principle explains and thus recommends or forbids many

practices, according to the circumstances of the soil, place, or season.

Third. To enlarge our actual knowledge by new discoveries susceptible of practical application.

On these several objects of natural science, in its applications to agriculture, it would be out of place at present to dilate. It will be sufficient if I briefly draw your attention to some of the general results, in reference to rural economy, at which science has already arrived.

With this view I might draw my illustrations from any one of the many different branches of natural knowledge. I might select for example:—

1st. The general relations of *Physical Geography*, to the art of culture—such as

a. The influence of broad seas and of great lakes and rivers, of tides, of sea currents, and of prevailing winds, on the capabilities of a country and the practices and profits of its cultivators.

b. The influence of mountain elevations and depressions, of high table lands and of low level plains—or

2d. The general indications of *Geology* in regard to the fertility of a country, the branches of husbandry to which it is best adapted, and the means by which its fertility may be best promoted.

3d. The relations of *Meteorology* and *Botany* conjoined—such as

a. The adaptation of certain plants to certain climates—of sugar, cotton and rice to warmer; of buckwheat, and Indian corn, and wheat, to warmer and dryer; of rye, barley and oats, to colder and more uncertain climates.

b. The nature of rust, smut, mildew, the maize, brand, &c., and the circumstances of local climate most favourable to their appearance—or

4th. The relations of *Geology* and *Vegetable Structure* conjoined—such as

That certain plants and soils are mutually adapted to each other, because of the special structure and natural habits of the plants, and the physical characters only of the soils.

5th. The general indications of *Geology* and *Meteorology* conjoined—such as

The relations or the nature of the rocks, of the soil, and of the fall of rain taken together—

a. To the necessity for under drainage, and the means of effecting it.

b. To the necessity for artificial irrigation, and the easiest mode of obtaining a supply of water for the purpose—or

6th. The general relations of *Zoology* and *Animal Physiology*.

a. To breeds of domestic animals, and to the preservation of their purity.

d. To the rearing, feeding and general tending of stock. To the agency of animal life in

utilizing the soil. To the attacks of insects upon our cultivated crops—or

7th. The general indications of *Chemistry*—such as, a. That a fertile soil, in addition to various organic compounds, contains at least eleven different mineral substances. b. That plants contain, usually, or in most of their parts, the greater number of the same mineral substances. c. That the animal, as a whole, also contains them, but distributed throughout its several parts in a manner different from that in which they are found, either in the plant or in the soil.

d. That the plant standing, as it were, between the soil and the animal, prepares for the latter both its organic and its mineral food.

e. That an intimate and beautiful relation exists between the soil, the plant and the animal—or between the living and the dead things of nature—or

8th. The general indications of *Geology* and *Chemistry* conjoined—such as

a. That certain Geological formations are especially rich in some of the mineral substances found in and required by plants, and produce soils which with special treatment will prove fertile and profitable to the cultivator.

b. That others are especially defective in some of these substances, and form soils which are naturally unproductive. c. That some abound in all the kinds of mineral matter which plants require, and yet yield soils which are naturally unfertile.

II. RELATIONS OF CHEMISTRY TO AGRICULTURE:—

Permit me now to say a few words on the subject of chemistry, in its relations to agriculture.

The special applications of this science, as many of you are already aware, are far too multiplied to admit even of enumeration. Of the practical ends which have been more or less perfectly attained by means of chemistry, I might mention such general ones as these:—

1st. In what *general* exhaustion consists, how it is produced, and how it may be repaired?

2d. In what *special* exhaustion consists, how it is brought about, either naturally or artificially, and how it is to be corrected?

3d. What plants, in general, require to make them grow well?

4th. What manures ought to contain, to be generally serviceable; what, with a view to special purposes, they ought specially to contain; and how they are to be artificially prepared?

But such topics are too general and indefinite to make a sure impression on the mind of the practical farmer, in the brief moments I have spent in enumerating them.

I mention further, therefore, such special points as the following:—

1st. How to bring crops to earlier ripeness in late and elevated districts.

2d. How to reduce the straw producing tendency of the land.

3d. How to hasten or promote, or to push forward, laggard, yellow, and stunted vegetation.

4th. How to strengthen the straw of your grain crops, where they are liable to be laid.

5th. How to fill the ear and make it larger, where long culture or natural poverty has reduced its size.

6th. How to improve the deficient feeding quality of turnip, and other root crops, when grown on mossy land.

7th. To quicken the organic matter in dead, deaf, or peaty soils, and make it available for the nourishment of plants.

8th. To prepare artificial manures, which shall nourish any crop on any available soil.

9th. To promote growth on *slow*, and to retard it on *quick* soils.

10th. On newly brought up subsoils, and on trenched land, what manures ought to be used, and why.

11th. Why a rotation of manures, as it is called by practical men, is necessary, and where.

12th. That the use of lime to a certain extent, and in a prudent way, is necessary to the highest fertility.

13th. That saline and nearly all other manures, do more good upon light and open, than they do upon stiff and close soils, and why.

14th. How to economise the consumption of vegetable food, and to adapt it to the purpose for which an animal is fed.

15th. How to prevent the disease called *fingers* and *toes*, in turnips and in other roots, and how to render mildew and ague equally rare?

To do these and many similar things economically, skilfully, and with more or less success, are among the practical ends to which chemical investigations have already led us.

They also supply answers to many practical questions, such as:—

1st. Why cabbage crops so greatly exhaust the soil, and how such exhaustion is to be repaired?

2nd. Why tares cut green exhaust the land, and give inferior wheat?

3d. Why tares are seldom good after crops of clover?

4th. Why lime produces a more marked benefit on one soil than it does upon another?

5th. Why one variety of lime is more useful generally, or in particular districts, on particular farms and fields, than another?

Of special points and questions, I could enumerate many more, in regard to which chemistry may be said to have been, or to be capable of becoming, of obvious money value to the farmer. Even to such of you, however, as have not much attended to this subject, the above examples will

sufficiently indicate both the kind of connection which exists between practical agriculture and practical chemistry; and the kind of uses to which such scientific knowledge may hereafter be put, in advancing the important art, which is the first wish of this great Society, and the individual interest of many of its members most zealously to promote.

LIMITS OF HUMAN SKILL.—But in dwelling upon and illustrating what is already in the power of man, and what he hopes to attain in reference to agriculture through the aids of science, I would not forget to acknowledge how very limited his knowledge is, and how feeble his capacities after all.

A mysterious fungus attacks the potato, and for years spreads famine and misery, and discontent and depression, among millions of industrious farmers.

A minute fly, season after season, hovers over our wheat fields, and from entire provinces and states almost banishes the cultivation of our most important grain.

A long continued drought, such as half a century past has scarcely seen, dries our meadows and pastures, and drives the farmer to his wit's end, to obtain winter sustenance for his necessary stock.

Such things as these ought to prevent us from boasting of our knowledge, and to enforce upon us that piety and humbleness of spirit, which rural occupations themselves so naturally foster—while at the same time they should not restrain us from any effort or enquiry by which the evils themselves may be mitigated or removed.

It is possible—nay, it is almost within the bounds of a reasonable expectation—that the same intellectual research which has given us dominion over the proud waves—has made out the laws by which hurricanes are regulated—has already almost freed us from their most fierce influences—and has forced the fiery lightning to descend harmlessly from heaven—that the same research may finally free us from the visitations of the fungus and the insect, and may place the dreary droughts of summer under reasonable control. Such hopes we may entertain, not as sources of pride, but as stimulants to exertion—for is so greatly rewarding the past exercise of our intellectual powers, the Deity obviously intends still further to excite us to study and extract good from the living and dead things of nature, over which he has given us a general dominion.

OBSTACLES TO PROGRESS.—There are, however, in every country, certain obstacles which oppose themselves to the progress of scientific agriculture, as a branch of knowledge, or to its practical application in the improvement of the soil.

I do not refer to those physical or local obstacles of climate, elevation above the sea, low prices, distance from markets, and so on; but to those social and class obstacles which, in so many places, and in so many ways, interfere not only with the rapid extension of our knowledge, but with the diffusion of what we already possess, as to the application of science to the rural arts. I may enumerate as belonging to obstacles of this kind:

1st. The aversion to theory, as it is called, which is so generally professed by practical farmers in most countries of the world. Rash and hasty theorising in regard to agriculture, it is right to reject; the error in confounding with such theory every thing that does not appear to bear directly upon the more common operations of the farm—as if chemistry, or the chemist, for example, could be of no use to the farmer, because he does not interfere with the handling of the plough—or with the shape or management of the drill machine, or the harrow.

2d. The small amount of talent hitherto in all countries considered necessary to fit a man to become an excellent farmer. This not only lowers the general education and attainments of the agricultural class, and the estimation in which they are held—but it unfits them, as a body, readily to appreciate the labors, or to listen to the counsels of men of science, however prudent and practical they may be.

3d. The special deficiency, among all grades of the agricultural community, (in England among landlords, among tenants and among laborers,) of any instruction in the elementary parts of those branches of knowledge by which the principles of agriculture are especially illustrated.

4th. The extreme sub-division of the land, which you may not see in this country for many generations, but which already exists as a great evil in some of the countries of Europe. It prevents the use of improved implements, and therefore the encouragement of agricultural mechanics—because the farmer is too poor to buy anything but the merest necessities. It prevents the purchase of manures, natural or artificial, to any extent—the employment of paid labor in farming—and generally all those forms of improvement which demand an outlay of capital, or to which the occupation of a considerable breadth of land is a necessary pre-requisite.

5th. An obstacle peculiar to your country, and to its present transition state—and it is really a serious obstacle to improvement—is the feeble local attachment by which the proprietors of the more newly settled districts are bound to their farms. This appears in the fact that so many of your farms are for sale. Few families have yet become so attached to their locations as to be unwilling to sell them, if a fair offer be

made. The head of the family trusts to his own skill to do better elsewhere for all his household, with the money for which they may be sold. This state of things will pass away as age creeps over your commonwealths and institutions, but in the meantime it operates as a serious hindrance to the expenditure of money in embellishment or in costly improvements, which might possibly not enhance, in a proportionate degree, the value of these properties in the market.

We are not selfish—perhaps I might say we are eminently unselfish—in wishing you to become agricultural improvers. But of all the arts, it may be said more truly of agriculture than of any other, that it is of no country. The producer of the common staff of human life, ought in all its perfection, to be the common property of all. In rivaling each other in our endeavours to push forward this highest art of life, Britain and America will be striving only which can do most for the human race. And if we in Britain should benefit hereafter by the advances you are destined to make,—beyond what you have obtained from us,—it will enable us only the more speedily to aid in diffusing a knowledge of these advances among the other nations of the globe.

Is there improvement any where—let it be seen among you. Is there agricultural progress any where—you ought not to stand still. Are there means of bettering the modes of culture any where—you possess the same. Is there greater knowledge any where—it is within your reach. Is there energy and determination any where—these qualities are inherited in as great strength by you as any other people. Is the climate favourable any where for special kinds of culture—you possess all climates, and may take a leaf from the farming book of every country. Is knowledge necessary any where—it is so among you; if not because of an overcrowded, yet because of a constantly moving, and at present rather retrograde agricultural population.—*Professor Johnston's Lecture.*

FIRST IMPRESSIONS OF GARDEN SCENERY.

Were there no standard of truth by which the objects in garden scenery, with regard to their character, position, and arrangement, could be judged; and were taste something of an irrational, fanciful, and capricious nature, as some have supposed it to be; then every designer would have something behind which he could shelter himself from all the shafts of criticism and of ridicule. "Let taste be free," would be the general motto; and it would follow in consequence that "I love to have it so, would have to be accepted as a sufficient reason for whatever might be done. But, however much this

principle may be acted on—and it is oftentimes acted on in practice, especially by amateur planners—it is none the less false and baseless. Why should argument be needed to prove that landscape gardening is a fixed art; that is, an art which, in all its variations of style, has immutable rules, founded on reason, which cannot be transgressed with impunity, and which must be obeyed, that success and approbation may be met with? Shall the theory of beauty and harmony be realised in the painting of the walls and ceiling of a room, and must all be left to caprice in the garden? Shall the architect have his five orders, and the landscape gardener no *orderly* arrangement of first principles at all? If architecture, painting, music, and sculpture, cannot be learned without strict attention to elemental laws, why should such attention be accounted needless in studying the art of laying out grounds?

Taste is either rational or depraved. When rational it will only be pleased with that which can shew TRUTH for its foundation. When depraved, it may be in a manner satisfied with that which is false and inharmonious. But when it has been uncultivated, and therefore unbiassed either way, it is yet pleased with the *first impressions* of harmonious garden scenery, and displeased with what is incongruous and disorderly, although in a way which its possessor may not be able to explain. Three instances of the way in which what is inharmonious or incongruous, is also unpleasing, even where taste is natural and uneducated, may here be adduced, and one may be taken from each of the three arts of architecture, decorative painting, and ornamental gardening.

Church architecture has of late, in many cases, become subject to the now established reign of iron. Pillars of iron in the interior of churches support horizontal beams on which the ceiling appears to rest; and, in as far as it is desirable that a preacher should see his hearers, and be seen by them, they are preferable to those massive columns of stone which take up so much space in large ecclesiastical edifices of an ancient date. But when these iron pillars are painted, so as to resemble wood or marble, as they almost universally are, it is impossible for any person having the use of his eyesight to enter, for the first time, a church in which they are present, without feeling that a want of *fitness* prevails, even although he may not be able to tell, or may not set himself to find out, wherein that want exists. It does not require that the taste of the supposed personage be educated or cultivated. Unless he be utterly disregardless of *first impressions*, (and few indeed are so), he will, it is most likely, experience that distracting influence on spiritual engagements which any want of fitness in seen material objects is ready to exercise. Even when,

it is known that iron, strong enough to support the apparent weight of the roof, exists within the unnatural coating of paint, there is still something that displeases and distracts, for an uncalled-for attempt at deception has been practised. Let the slim iron pillar be painted so as to appear what it is, and the idea of sufficient strength will at once be communicated. The mental influence of church architecture has doubtless been elevated to too high a place by some; but, by others, and especially in Scotland, it has been too much disregarded. But it is not in churches alone that men have availed themselves of the strength of iron, while the iron itself has been disguised. Enter the much vaunted City Hall of Perth, and say whether those slender and fairy-like pillars of white-veined marble, be at all sufficient to support the weight of the roof. And when, on second thoughts, you are convinced that they are composed of iron, but *marbled*, as the house painters would say, tell whether your second impressions are any less disagreeable than the first. They will even be more so, for it will have been discovered that deception has been practised, while a want of fitness is still apparent. The prevalence of such deceptive practises in decoration, shows how much the influence of first impressions is disregarded, and that from a blind submission to the dictates of fashion.

The relation of an incident which recently happened may serve for our second case. A new steam-ship was lying at a quay side, and the painters had just gone over her upper works with their brushes. The colours employed were blue and green. Two or three little girls passing by constituted themselves judges of the effect produced, and their verdict was expressed in the condemnatory words, "What a taste!" It is not likely that they had studied in a set and formal manner, the principles of decorative colouring; but the same intuitive perception of right and wrong in this matter, which had served to guide them in the adaptation of ribbons to the parts of the dress which they were designed to decorate, was sufficient to impress them with the idea that blue could not form a right contrast with green, which it never can, because green is a mixture of blue and yellow, and requires for contrast some colour that is different from either.

The free unbiassed opinions expressed by visitors to gardens, though intended merely as casual or passing remarks, often, yea generally, coincide with the conclusions of rightly directed logical criticism. Let us suppose a case:—A flower garden has been laid out, say fifteen or twenty years previous to the time of its supposed inspection, in front of a mansion-house, and on grass. The shape of the ground is semicircular, the front wall of the house forming the straight line of the segment. The walk

in front of the house is straight, and that which leads round the bending side of the garden, bends correspondingly; and all this is right. But the flower beds are too large, and lie scattered nearly at equal distances over the grass, and with little apparent adaptation to their respective positions. Being large, they have been planted with a mixture of flowers, and shrubs; and tall growing shrubs, both climbers and standards, have been planted here and there between them on the grass. A semicircular shrubbery bounds that side of the garden farthest from the house, and serves the good purpose of conferring seclusion on the scene, and preventing the eye from wandering to distant objects. After the lapse of time already indicated, let us suppose this garden to be visited by a party of individuals, who, in any opinion they may express, will be guided by the natural impressions of a first view, and will speak without any acknowledgment of fashion or its influence. In some respects the scene exhibits a maze of beauty, but its beauty is unartificial, and of a kind that would be better displayed in the rude scenery of Nature. Flowers and shrubs appear in unseemly mixture. A pyramid of roses overpowers the modest violets that grow at its base. A wide spreading plant of *Ribes sanguineum* occupies its own share of ground, and part of its neighbours, that neighbour being a defenceless *Campanula*. Some delicate annuals are overshadowed by a dense *Arbor-vitæ*. A towering Scot's thistle has, in one season, attained unto twice the height of the under shrubs, that surround its base. In the shrubbery, an unlucky Cedar of Lebanon, now attaining the character of a tree, finds itself hedged in by shrubs of all descriptions, with none of which it can harmonize, and yet is prevented by their presence, from indulging in its native gloomy and unsocial grandeur. The "first impressions" of such a scene will be decidedly unfavourable, and may be expressed in such words as these,—“The garden appeared very disorderly and ravelled like; it has much need to be put in order.” And yet there is more of truth than of supposition in the case described; and the description is in most respects applicable to more than one flower garden in this country. Had the beds in the garden above described been placed alongside the walks, leaving an unbroken expanse of lawn in the middle of the ground; had some beds been set apart exclusively for flowers, and others of a larger size for the finer shrubs; and had the taller growing shrubs been kept by themselves on the far side of the surrounding walk—one part of the scene would have contrasted with the other, and true variety would have been produced—variety, which consists not in indiscriminate mixture, but in a separation and condensation of parts. The expanse of lawn in

the middle would have served as a resting place for the eye, and have added to the intricacy of the richer parts. The principles of congruity, order, symmetry, and variety, would have been acknowledged; and also the principle of utility, which should not be forgotten even in a flower garden, and which requires that flowers should be placed by themselves, that their growth may not be injured by the proximity of shrubs and trees.

DAVID GORRIE.

November, 1849.

POULTRY-HOUSES

Are essential arrangements for the preservation of your feathered stock, which should be placed, if possible, as to have an eastern aspect, so as to be open to the morning sun; sheltered by a plantation, or sufficient shrubs, to screen the birds from the summer mid-day sun, or inclement winter winds, both being equally injurious to them. The poultry-house should be constructed to give as much warmth as possible, consistent with sufficient ventilation, the advantage of which is quite evident, from the circumstances of the cotter, who has his poultry roosting over his fire, laying abundantly during the winter months, while the opulent farmer, who houses his poultry, in his spacious poultry-house, is not supplied with eggs. The more compact they are kept during the winter months the better, as each will contribute a share of heat to the other, and add to their comfort, and induce laying; the size to be suited to the number kept, and the more compact they are kept in winter the better. The floor should be elevated, so as to be perfectly dry, and of such materials as to allow its being swept or raked out daily. The walls close and substantial, so as not to harbour vermin of any kind, and be frequently whitewashed; with a good air-tight roof that will fully resist the rain—damp being most destructive to poultry. Windows should be placed in opposite directions, so as to admit of thorough ventilation each day during the summer months; but one window should be carefully closed, even in the summer time, as there is nothing more injurious to poultry than a thorough draft of air during their sleeping hours, and both windows should be punctually shut up every night during the winter season. In order to admit ventilation and prevent the poultry passing through the windows, a wire lattice should be fitted to each. I would particularly advise the roosting perches to commence low, say about one and a half feet from the ground, and ascend gradually, in the form of a wide ladder; the perches to be placed about twelve inches apart, with an elevation of twelve inches above each other, so as that the droppings of one bird may not soil the plumage of

the other; and to be from one and a half to two inches in diameter, with the sharp angles taken off. The value of low perching cannot but be known to most keepers of fine large fowl, who are sure to break their breast-bone when coming down from high perching, and from which they scarcely ever recover. Nests are frequently constructed in the building of poultry-houses, which is, by no means, a bad plan, as they are free from the droppings of the fowl, are rounded in the shape of a nest at the bottom, and a coat of lime, at any time, renders them perfectly pure. If they are not so constructed you will have to furnish your hens with boxes or baskets, placed steadily, furnished with straw, cut short, so as to prevent accident to the eggs, and should be frequently renewed, and the nests kept perfectly clean. I would prefer boxes or baskets for hatching, as being less exposed to the action of the air; and, as with the perches, I would recommend their being near the ground, so as to imitate nature, as much as possible, and permit the hens to enter with ease. If there is a difficulty about entry, the eggs will be broken; and if the hen fall when about entering a high nest to lay, if hurt, she will be likely to lay soft or misshapen eggs; I would, therefore, advise them not to be elevated. Hatching on the bare ground, as in the case of a hen laying out, has been found most successful, the evaporation from the earth inducing incubation; as a substitute for such evaporation, Cantelo finds it necessary to damp the eggs daily with a sponge. An aperture should be constructed in the door, to admit the poultry in and out, a little elevated from the ground, so as not to induce vermin to enter, with a perch for the convenience of the birds. They should be supplied with pure fresh water daily. If a corner in the house were furnished with fine sand, as a sand-bath, for the poultry, it would conduce to their health and gratification, by ridding them of their accustomed parasites. I do not approve of paved yards for the large fowl, which so frequently brings on them both gout and corns, at a premature age. A shed in the yard, or other shade, is essential to shelter them from rain; and fine sand, in a poultry-yard, is much preferred to any other walk.

As I keep all the fine poultry, pheasants, &c., I am obliged to divide my pheaantry or poultry-house into separate compartments, in order to have them distinct. I have, therefore, erected, to the front and roof, a wire lattice, with lattice doors, which open from the one into the other, so that, by leaving the door open, I can enlarge the compartments, and form two into one when occasion may require it. It is at the extreme end, and fronting a garden, which supplies the birds with an abundance of vegetable matter, with an opportunity of occasionally passing from the rear, into a grass plot. It is elevated above

the level of the garden, and being in the vicinity of the sea I have in it, several inches of sea-sand, which keeps the fowl clean, comfortable, and in good health; and in this sand they delight to roll themselves.

IN COLLECTING EGGS, FOR HATCHING.

You should prefer those newest laid, and while gathering, to be kept dry, clean and free from damp or foul air; and if imbedded in dry bran, you will find the advantage. You will have to recollect the necessity of impregnation by the cock; and prefer the moderate-sized eggs—the over-large or over-small, not being advantageous for hatching—the soft-shelled or ill-shaped egg to be rejected. It is absurd to suppose that the gender of an egg can be ascertained from its appearance. The hen usually commences laying in the spring, and again in the summer; but if kept warm and well-fed, you may have eggs at any season. The approach of laying is indicated by the comb and wattles of the hen becoming a bright scarlet. The eggs should be taken from the nest every afternoon, when no more may be expected to be laid; for if left in the nest, the heat of the hens, when laying next day, will tend to corrupt them. Some hens are much more productive than others; I have had some of the Cochin China to lay two eggs a day, not constantly, but occasionally, with one egg on the intermediate days. But the grand secret of procuring an abundance of eggs, is comfortable housing and abundance of food. Early pullets will lay all the winter, if well housed and fed. The laying continues more or less during the summer, until the moulting commences. The older the hen, the later she moults, and, consequently, commences to lay later in the season, perhaps not till April. The air-bag is placed at the larger end, between the shell and its lining membranes, it is about the size of the eye of a small bird, in new-laid eggs but is increased as much as ten times in the process of hatching. The air-bag is of such importance, to the development of the chick, that if the blunt end of the egg be pierced with the point of the smallest needle, the egg cannot be hatched. The freshness of the egg may be easily ascertained, by the small circle denoting freshness, and the large circle the contrary.

FOR HATCHING.

You will recollect the eggs must be rendered reproductive, from previous treading of the cock, as well as being fresh, and not exposed to bad effluvia or moisture, and while collecting, previous to hatching, covered with bran. Some say pointed eggs produce cocks, and round ones hens; and others, that if the vacancy caused by the air-bag, at the blunt end of the egg, appear to be a little on one side, it will produce a hen; if this vacancy be exactly in the centre, it will produce a cock. Not having faith in the

above, I quote it for the advantage of those who may wish to test its authenticity. If fresh eggs are laid, after the hen begins to sit, they should be forthwith removed; and if she break any of her clutch, they should be carefully cleaned away, and her feathers, if soiled by the broken egg, made perfectly clean. Old hens are, in general, better sitters than pullets; and middle-sized plump hens better than the very large ones. The clucking of the hen, when she has an inclination to sit, cannot be mistaken. It is best to have a few valueless eggs to put under a hen, for a few days, to ascertain if she will sit steadily, before you intrust a valuable clutch to her; when you do, give her the eggs intended to be hatched; the time of incubation being twenty-one days, at which period you should expect the chickens to be appearing; but should any of them be heard in the shell, for 20 hours after they should come out, you will have to assist them, by breaking the top of the shell; and if found to be glued to the shell by the white of the egg, the bird must be assisted to extricate itself by the most gentle means, and but at small intervals, at a time, and during a lapse of from twelve to twenty hours—no hurry, no violence.

The day of their exclusion from the egg, the chickens do not want to eat, but should be left in a clean and comfortable nest. The next day they may be put into a coop or basket, with some clean and comfortable lining, and fed with soaked bread and milk, an egg boiled hard, and chopped fine; pure water is essential. When about a week old, turn them out in the sun, of a dry day, for a short time, and feed them with oatmeal, curd, chopped egg, and bread crumbs, with chickweed or lettuce cut small. When a fortnight old they may be permitted to follow the hen, where she will scratch up insects for them, which are most nutritious. Economists in poultry, frequently add two clutches together, by putting the second under the hen at night, and then giving another clutch of eggs to hatch, to the second hen, or permit her to lay. The care of the hen is continued to the chickens, till they are enabled to provide for themselves, after which you are to reserve the largest and finest to continue your stock, of both cocks and hens, and use at the table, or send to market, the inferior.

After rearing your chickens, your next consideration is

FATTENING

For table or market; it is best accomplished by cooping in a moderately warm, rather dark, quiet place, with good ventilation, and the fowl fed on boiled or steamed potatoes, into which oats or oatmeal is blended with sweet milk, and some fine sand added and given warm, but not hot—the fattening will be accomplished in a fortnight—or boiled carrots, with beans, peas,

or barley and sweet milk; in all cases of cooping the fowl must be kept dry, clean, and warm.

Nothing is easier kept than fowl; they obtain their living promiscuously, and pick up everything that can be made use of as food, in the farm-yard, even the worms give them most nutritious food; since the blight has proved so destructive to the potato crop, it has been satisfactorily proved, there is no substitute for it, as a feeder or fatterer of poultry, or a promoter of laying; if the potatoes are broken, and if a little corn be added, they will be the more palatable; the more varied the food the better; boiled carrots, turnips, parsnips. Jerusalem artichokes, or other roots mashed with bran, form a healthful variety: as to green food they are partial to lettuce, endive, cabbage, spinach, radish, turnip, mangel-wurzel, chickweed, grass seeds, &c., and if insectivorous food is wished for, there is nothing more easily procured at almost any season, by procuring a deep crock, into which put some bran, and on it lay a piece of carrion or other flesh, cover it with a glass cap so as to admit the light, but exclude the rain; in a few days it will be a moving mass of living insects, which you can throw out to your poultry; there is nothing they will so greedily devour; they should be sparingly given, as the fowl are so fond of them, that if given abundantly it will prevent them taking their usual food.—*Farmer's Gazette.*

ON THE SAVING OF MANURE.

As your Society has offered a premium to the farmer who has displayed the most intelligence and economy in saving and making manure, and as I am convinced that upon this depends in a great measure the successful prosecution of agriculture in this country, I am induced to lay before you my experience in the matter. The exhausting process of farming hitherto carried on in this Province, cannot be improved, save by the production of a larger quantity of manure than heretofore. Convinced of this, I, in the month of July, three years since, hauled out of a bog eighty cart loads of bog earth to the end of the land where I intended to apply it, mixed it with eight hogsheads of quick lime, and let it remain until the following spring, when I spread it, broadcast, on about two and a-half acres of land, which had been ploughed about the time I hauled out the bog earth. I sowed it with oats, timothy, and red clover, and harrowed it properly. I had a good crop of oats that year, and an excellent crop of hay the next year. I did not, however, like the look of the heap; when I turned it over, the lime seemed dead, and the bog wet and cloggy. There was about thirteen or fourteen loads of the bog earth left, with which I had not sufficient lime to mix, and it laid over winter. I determined to try how barn manure would do to mix with it. I

accordingly put six cart loads of the barn manure to the bog and let it stand for four or five days, when I found it in a complete state of fermentation. I applied it to a piece of ground alongside the other, and I found the crops to be superior to the latter. The next year I hauled one hundred and seventy loads of peat to the field where I intended to apply it, and to every seventh load I added one of earth. I turned the heap over twice in the summer, which I found improved it very much. As soon as the frost left in the spring, I had the barn manure admixed, one load to two of the peat, with the latter finely pulverised, and thrown loosely in a compost heap, ten feet in width and five feet in height. I then left the heap to do for itself. I then harrowed the ground, picked off the stones, and struck out drills two feet apart, and left the ground prepared for the reception of the manure. In four days I found the compost in a proper state of fermentation. (It is necessary to have a few loads of earth convenient, lest the heap would overheat, to throw on the top, two or three inches, to prevent the escape of the ammonia or gas.) In a few days the compost packed down eight or ten inches into a solid mass of fertilizing matter. I let it stand for four days, then hauled it out on the land, thirty-four single horse-load to the acre, and covered it up with the plough in the drills. I put in carrot seed; the day following I found the manure had warmed the ground, and, notwithstanding the dry weather, the seed germinated, and in four days they appeared above the ground. I planted in the same acre of ground, potatoes, carrots, turnips, beets, cabbage, and corn, all of which grew abundantly. So, sir, like the Irish bog, there is something very extraordinary in the peat if properly manufactured, and I would strongly recommend that in all cases the peat should go through a thorough course of fermentation, and, if possible, be applied to the ground when warm. It may be asked why not add more earth to the heap? I answer, it would prevent fermentation. The manure that I mixed with the muck was that of six cows and two horses, which was evenly mixed through the winter, in the barn-yard. But, sir, our farmers will think very hard to quit their old method, which was to haul out their manure and apply it to the ground cold, wet, and unmixed, which, if it never was to be put with a compost, it would improve it very much to turn it over, and let it stand for a few days to warm a little before being put in the ground. In our cold spring weather, care should be taken not to put any lime in the same compost with barn manure, as they never agree: the one is sure to eat up the other. It may be asked also, would not quick lime do to mix with peat; and I think it would, by preparing the peat the same as above described, and in the spring, break the lime into small pieces, and put it

through the peat till it slacks; then turn it over and let it stand four or five days—say, put one load of lime to six loads of muck—this, I think, when put on the ground warm, would be a very good manure. But this is not the method followed by the farmers of this locality; they commonly mix the lime with the wet sour muck, without turning it over in the summer, or soaking it, or waiting for the required power of the atmosphere to manufacture it; in the spring the lime is dead, and, I think, can be very little service to the land. Charcoal would be another excellent ingredient to make manure, especially to the farmers in the interior parts of the country, who cut so much wood-land down annually and burn it on the ground. If the farmers would make charcoal of part of the wood they burn up, they would find it very much to their benefit. I think that sea-weed would be a very good ingredient to mix with peat for compost, but this article is only to be obtained along the sea board of this Province, and could not apply to the interest or benefit of the farmers generally, but only to those farmers who reside along the sea coast. Neither can lime be had except in particular places in this Province, and then it must be purchased at a very dear rate, placing it entirely out of the reach of small farmers, or of those living in the back settlements and interior parts of the Province. I think the simple method of making manure that I found out by experiment, would tend to the general good as well in the most remote parts of the Province as in those localities, as the article can be got almost on every farm, with no other cost than that of manufacturing it, and it is within the reach of the poor farmer as well as the rich; and although simple as this mode of making manure may appear, any farmer who will add to his manure heap twice the quantity he makes at his barn-yard, and follows it up annually, together with rotation cropping, may rest assured his farm would soon have a different appearance to that which it has this day. • I have one hundred and seventy single horse loads of bog earth now prepared as above for the ensuing spring. I find this description of manure more nutritious to plants than any other I have yet used. Another good tendency fermentation has on manure is to destroy the foul seeds, such as dog-nettle, sorrel, and other seeds, which remain safe and sound through the winter about the barn-yard. The rough buck-wheat is a grain that is sown very much these last three or four years all over the country, the seed of which is almost imperishable, and gives the farmer a great deal of trouble in weeding out from amongst his crops; it might be destroyed by putting the manure heap through a thorough course of fermentation in the spring, before applying it to the ground. This description of grain the farmers heretofore hesitated in sowing,

in consequence of the great difficulty they had in clearing it out of the land; this difficulty can easily be removed by the following method: As soon as the grain is removed off the land where it has been grown, put on the harrow and harrow in all the fallen grain smoothly. In a few days a young beard will come up, which should not be interfered with. Now have it eaten down with cattle in order that the seed may be well exhausted before the frost sets in, which will kill the green beard, and the farmer may rest assured it will give him no more trouble.—*Nova Scotia paper.*

THE CHRISTMAS MARKETS.

SMITHFIELD.

One of the most important signs of the near approach of Christmas is the advent of the Smithfield Club Cattle Show. The great annual agricultural gathering is one of which the country has reason to be proud, for no other nation on the face of the earth can afford a similar spectacle. The exhibition for the present year in some respects excels all its predecessors, and certainly betrays no symptoms of depression in the rural districts, whatever may be said on that subject at public meetings or market dinners. One thing for which the present year was peculiarly praiseworthy was the general absence of that enormous obesity which it formerly seemed the grand aim of the breeders to produce. A better taste now prevails, and which, it is not assuming too much to assert, has been chiefly brought about by the press. While the animals in all the main points were no wise inferior to those displayed on previous occasions, they constituted this year the truest and best exhibition ever witnessed. Although the different breeds exemplify divers peculiarities, they all furnish incontestible evidence of the care which has been taken in rearing them. It is in this rivalry or competition between counties that the principal value of these yearly re-unions is to be found. They stimulate constant endeavours to improve farming stock. The time, however, for eulogy on that head is past, and nothing more is now required than a just appreciation of the excellence of the institution. Let the managers continue to proceed in their noble career as they have hitherto done, and they will command, as they deserve, universal commendation. Without the slightest disposition to cavil or carp at the decision of the judges, it may be mentioned, *en passant*, that the distribution of the prizes was not exactly in accordance with all opinions; nor is this a theme for wonder, when it is considered that the general qualities were so nearly on an average as to render the task of discrimination extremely difficult. The grumblers, however, were but

few, and the matter is hardly worth a passing remark.

Bearing in mind that the prime object is to put the greatest quantity of meat on the animal in the shortest space of time, and at the least possible expense, the show just terminated appears to have been eminently successful, and there never was known a quicker sale, most of the lots having been bought on the first day, and the remainder on the second day.

The cattle generally were capital specimens, and the Devons in particular remarkably fine. Of the sheep the Southdowns may be said to have borne off the palm. The Earl of Leicester's were superlative samples. The pigs were admirable. It may be here remarked, that the disinclination to patronize excessively fat animals was general, and it was observed that there was more butcher's meat and less for the tallow-chandlers than had been ever before known, and it is this circumstance that may be attributed the rapid sale of the various kinds of stock. It is not, indeed, the interest of the breeders to cultivate so much unnecessary fat, which will only realize 3d. per lb. to the butcher, whereas it has probably cost the breeder 1s. per lb. or more.

Upon the whole, without entering into minute comparisons between the present and past exhibitions, suffice it to state that the Bazaar never displayed a more interesting or excellent collection than that for the year 1849, both for quantity and quality.

The alterations projected last year were this year carried into effect, namely, the show commenced on Thursday and ended on Friday.

READING AND THINKING.—Those who have read everything are thought to understand everything too; but it is not always so. Reading furnishes the mind only with materials of knowledge; it is thinking makes what we read ours. We are animals of the ruminating kind, and it is not enough to cram ourselves with a great load of collections; unless we chew them over again they will not give us strength and nourishment.—*Locke.*

KNOWLEDGE AND COURAGE.—Knowledge without justice becomes craft; courage without reason becomes rashness.

THE COMPOSITION OF FRIENDSHIPS.—A mountain is made up of atoms, and friendship of little matters; and if the atoms hold not together, the mountain crumbles into dust.

SUCCESS AND FAILURE.—Nothing like success in this world—what dirty bread it will butter! Nothing so miserable as failure—what heroism it will blacken!

Agricultural Journal

AND

TRANSACTIONS

OF THE

LOWER CANADA AGRICULTURAL SOCIETY.

MONTREAL, FEBRUARY, 1850.

In one of the numbers of the Agricultural Journal for last year, we submitted some observations on the subject of "Associations of Agricultural Credit," and the principle upon which they are established in several of the European States, and humbly suggesting that such associations might be advantageously introduced in Canada in aid of the improvement of agriculture. If the reports of the prosperous working of these associations in other countries be correct, (and they have been established, in some instances, nearly a century,) it should be sufficient encouragement for the people of Canada to try the experiment. Indeed we cannot see that there would be any risk incurred by their establishment. In a new country like this, rich and fertile, capital is an essential requisite, to enable us to draw forth the rich resources of the soil. We should not be deterred from doing this, because we have lost the protection and preference of the British markets for our produce. Let us make our country rich in productions, and what we cannot advantageously export of these productions, we must strive to find customers for at home, by encouraging manufacturers of our own, who will exchange their goods for our produce. This course we shall have to adopt to some extent, and it is manifest we cannot purchase from Britain if she does not buy from us. We have hitherto exported our produce to England, at a very high expense of transport, to be sold to those who manufacture goods for us in that country, and which comes out

to us, charged with the expenses of transport, revenue, &c., to this country. We may very well understand how these expenses of transport, back and forward to Britain and Canada, act in augmenting the cost of articles we purchase, and diminishing the price we obtain for our produce. Hence it would appear there would be a considerable encouragement for the establishment of manufactories, that would purchase on the spot our produce, saving all the expenses of a long transport to Britain, and sell us their manufactures on the spot also, free from all expenses of importation from Britain. We do not say that the establishment of manufactories here would do everything for us, because if they were able even to manufacture all the soft and hardware goods we now import, it would not, we believe, amount to £2,000,000 annually; but undoubtedly such establishments would greatly assist us, and we do not understand why they should not succeed under the circumstances we have mentioned. We hear constantly of the numbers of persons who emigrate from this country to the United States, in search of employment which they could not obtain here. Why is this the case? It is not certainly because we have not abundant employment for them and many more. Our lands are not drained or half cultivated for producing good crops, and we might have the manufactories we have alluded to above. If we had the "Associations of Agricultural Credit," it would give a new and beneficial impulse to our agriculture, and it would so greatly augment our productions, that they would afford us the means of establishing and supporting manufactories. Where a country is only yielding a scanty produce, there can be no sufficient support for manufactories, and they cannot succeed; but in a country of abundant productions, manufactories must flourish, and they will assist the farmer, as the farmer will support them. There is no

mode we are aware of that could be made available for affording farmers occasional accommodation to assist them in improving their lands, except by "Associations of Agricultural Credit." The security would be ample, as it would be founded upon the whole of the farmers' property throughout the country. There could be no better security than this. The amount of property in the hands of the farmers of the Province of Canada, including their lands, improvements, domestic animals, implements, &c., cannot be less than from fifty to sixty millions of pounds currency. Who then, we would ask, would be better entitled to have means of accommodation afforded them to carry on their business successfully? It is only such a system of accommodation as we have pointed out that would be suitable for them. It is generally admitted that the system of "Cash Credit," established in Scotland, has been the chief means of improving the agriculture of that country. This system has succeeded admirably for the banks and for the farmers, who were accommodated. No wonder the backward state of agriculture here, when so little has been done for its interests. The farmers possess a very large amount of property that is fixed in the country, and after all, they have no means of accommodation they could safely avail themselves of, however necessary and beneficial it might be, and they are very frequently brought to utter ruin for want of a trifling aid, and prevented making improvements that might double their produce annually. All these matters deserve great consideration, if the improvement and prosperity of the country is desirable. We may suggest measures which we humbly conceive would promote the welfare of the country, but if no further action is taken upon our suggestions, we might as well be silent. We can, at all events, safely state that it is not from any defect in our soil or our climate

that any of our population, or emigrants coming to this country, desert us, and go to the United States. Notwithstanding that we have but one seaport, and even that closed for four or five months of the year by the severity of our winters, there is not a country on this continent that might be more productive and prosperous than Canada, if her vast resources were made available properly. As regards her agricultural capabilities, we take leave to say, that the labour of a man, or of a horse, judiciously employed in agriculture here, will create as much produce as it would in the British Isles, or in any part of North America that we have seen or heard of. What then should drive any of our population from hence to seek better fortune in the neighbouring States? A large portion of the produce raised in the United States, partly by emigrant labour, and emigrants from Canada, is exported to Britain. What is the cause that we should not employ those emigrants, and raise with their labour, on better soil, produce to export to Britain? We want capital and skill to employ it; but why do we want it, and what is it that prevents us from having, both as well as our friends on the other side of line 45°? There is as ample security here for any accommodation of capital necessary for the due improvement of the country, as can be had on this side of the atlantic; why then should it not be forthcoming?

If our country was situated ten degrees more to the north than it is, we might be excused for wishing to move southward; but what are our advantages? We have a most superior soil, and a climate proved to be genial, and favourable to agriculture, and capable of improvement, by clearing of our forests, and a more perfect drainage of our soil. We have water communication by rivers, lakes, and canals, not surpassed by any on earth, extending into the country a distance of fifteen hundred miles from the

sea, and branching off in all directions from the main line of navigation. All these branches may not be navigable, but they are capable of being made so, and thus affording employment to those who leave us for want of it. By what means do we expect to improve our country, and make the most of our natural advantages? We certainly cannot move it southward to improve our climate. If we want energy and capital to improve it, what prevents us from having both, when both are within our own power? We cannot import them from another country for our advantage, although parties possessing such valuable commodities coming to reside among us, may employ them very much for their own advantage, by making a proper use of what we neglect to improve. Are we children in Canada, unable to do anything for ourselves, or help ourselves? We should be ashamed to own it, if we are so. We derive our origin from the same nations that have peopled the United States, and we are no credit to our fatherlands if we do not strive to equal our neighbours in everything. What should make us inferior to them, unless we are so deficient in patriotism as to fancy it impossible for us to be so. If we want examples of improvement, and energy to accomplish them, where can we find them to exceed our father land? We are no better than the degenerate offspring of two great nations, while we see our people emigrating from us for want of employment, and only lament our condition, without taking immediate measures for employing those people, and improving our condition when the means are in our power. Suppose we imagine these means not to be in our power, under our present circumstances, where, we would ask, under Heaven, do we expect to obtain them? Canada must be improved by her own people, and they are unworthy the possession of such a noble country if they neglect to do so, or allow themselves

to be persuaded that they are prevented, or incapable of doing so. If there exists any obstacle at this moment to the improvement and prosperity of our country, who but ourselves are capable, or should be employed, to remove or remedy them? We are not children—we are men—and should act as men, in adopting, at once, any measures necessary to promote the welfare of our country and our people. There is a thousand-fold more difficulty to be apprehended in seeking to improve our condition by any other means, than those that are in our own power to employ without danger or hindrance. Let us create a capital for ourselves that we can rely upon and retain. Any other capital we could induce to come to our aid will leave us again, augmented by the produce of our industry. The amount of capital that would be required would not be very large for the due improvement of agriculture. It would not be advisable to make an extravagant expenditure, but so far as would be expedient, no employment of capital would be so advantageous to the country as that applied to the augmentation of our productions, as it is the fields of Canada that must support our trade and commerce, our cities and towns, and also our revenue for the support of our Government. It is a plain fact, requiring no proof, that no country or people can buy more than they can sell, if they pay for what they buy. Is it not manifest then, that if we wish to improve the condition of our trade and commerce, and of our cities and towns, we must first augment the quantity and value of the productions annually created from our lands. The grand error in our system is, that capital has been employed in building cities and towns instead of applying it to improve the country and increase her productions. We can now perceive the consequences in the number of houses and stores that are untenanted and unoccupied. It is an absurd opinion to entertain, that the prosperity of

trade and commerce is not chiefly dependent upon the prosperity of the country. Let the country produce largely the most valuable products she is capable of, and there is then, at our disposal, an actual amount of value to be exported, where it can be done to advantage, and what cannot be exported will be at our disposal for the encouragement of manufactories, and support of them when established. It is useless to build stores to sell goods in if there is no means to purchase. Manufactories cannot flourish in a country that is not in a prosperous condition, unless the goods manufactured can be sold to foreign customers, and we believe this could not be expected by our manufacturers. The most they could expect would be a home trade, and consequently there will be a limit to our manufactures—that they never can be our chief dependence until our population are vastly increased. Home manufactures may assist us to a certain extent, but those who would expect to raise the country to a high state of prosperity by them alone would be disappointed.

Our object in writing this article is, to endeavour to persuade all parties who may read it to think well of this country, and to rest satisfied that we possess within ourselves all the power and means that are necessary to make it as prosperous a country as any on this continent, if we only employ them judiciously. It is honorable for us to rely upon ourselves, and upon the vast resources within our power. We are highly favoured in the country and the advantages we possess, and if we have been hitherto disappointed in our expectations, it would be well for us to examine what these expectations were, and whether it was not our fault when we did not realize any expectations that were reasonable. What we are most anxious to see is, every member of the Canadian community uniting, heart and hand, in their exertions to find out what can be done to promote the

general prosperity of the country, and to adopt promptly any measures most likely to effect this good for all. There is no hope for our country or its prosperity while agitated by parties whose views are as opposite as the Poles. Let the love of our country prevail over all other considerations. A united people can make it a most prosperous and happy country, but disunion and party strife may ruin everything. It is utterly hopeless that any measures can be introduced for the general good if we cannot agree as to what these measures should be. At some future time, it will be matter of astonishment with those who succeed us, that we should so long neglect to improve the opportunities we had to advance and secure our prosperity, and at a period when improvement made such advances in every other country. We hope these suggestions will induce some party more competent to discuss this subject than we are, to take it up, and do it justice. We disclaim any intention to give offence. Our only object is the general good of the land we live in—not by the means we suggest, if better and more honorable can be proposed and adapted by us as a portion of the British Empire. In our father lands, men of all parties can unite in the most cordial manner to advance the interest of agriculture—the general welfare of the whole people being so much dependent upon it.

AGRICULTURAL REPORT FOR JANUARY.

The month of January has sustained fully the character of a Canadian Winter, up to this date, and we do not regret it, as it will have completed the bridges over our rivers in all directions to admit of the farmers coming to market with the produce they may have for sale. We hope they will, however, have considered what we submitted in our last Report, respecting the sale of produce. We regret that the prices of produce at Montreal are not more encouraging to the farmers, particularly that of

wheat, beef, and pork, which are all exportable articles. The wheat is of fair average quality this year, and was harvested in good condition. Pork is, perhaps, of as good quality as any that can be had in North America, fattened principally on peas, and indian corn, and peas are considered excellent for making good pork. We have seen very good pork sold at 23s. 1½d. to 25s. the hundred pounds weight, and this price does not pay the farmer well. The best beef, we have been told, was worth 30s. the 100 lbs., and we believe it has been sold from that price downwards, to one penny half-penny per lb.; the latter price, it is said, farmers have sold quarters of beef for in the Montreal market the quality of course could not be very good. From the market prices in England lately reported for salted beef and pork, one would imagine, a higher price might be paid here for any beef fit for exportation, and pork, as we have it, being excellent. We believe, if our pork was made into good bacon and hams, cut and cured as they do in England, that it would find a better sale, and more certain market, and there would not be any difficulty in adopting this plan. The price of bacon at Liverpool is from 40s. to 48s., and hams 60s. to 62s.; in London, the prices are 62s. to 72s. for hams. Canadian pork, bacon and hams, might be made to equal any in the British Isles, the food upon which they are fatted here being generally of better quality, than what they are fed upon in these countries. The price that can be obtained for salt butter of good quality is not to be complained of, and we have no doubt if farmers were more careful of making it up, and packing it in the proper sort of kegs, made air-tight at each end, a higher price could be obtained for butter. It is a great fault in salt butter when not of uniform colour, and saltiness, in the same cask, and also when it is not packed closely, without any openings between the butter. Any man experienced in the making and packing of butter, and the consequences of these objections,

which we submit, will admit our objections to be well grounded. All this, however, can be remedied by the butter maker and packer, and when a large quantity of butter would be made, the difference in value of the butter for a season would be very considerable, perhaps from one to two pence per lb. These are matters of some consequence to farmers, as good butter may be made in Canada, by skill and attention, as is produced in any country, without exception. Undoubtedly milch cows require care, in their summer and winter feeding, and we could not expect to make good butter from them otherwise. Exposure to great heat in summer, without shelter, and driving them a long distance to and from pasture, is very injurious, and should be provided against. These circumstances may be considered by many as of no great importance, but such is not the case. Every day we may see ill tasted and bad coloured butter in our markets, while other butter is excellent in taste and colour. There can be no cause for this, except the more judicious management of the cows and the dairy by those who have good butter than those who have bad. While we despise trifles in any part of agricultural management, we shall not excel as farmers or producers. The quantity of fowl brought to market this winter has been very large, of good quality and at very moderate prices. They are, and might be, a considerable item of the farmer's products. They do not cost a great deal for their keep, and they are a pleasing appendage of every farm-yard. The feathers are useful to the family, and if not required, may be sold for a fair price. Fowl, doubtless, pick up vast numbers of the insect tribes, that are the pests of agriculture. If more fowls were kept, and wild birds not wantonly shot down, for the mere pleasure of *killing*, we should have less insects to trouble us, and injure our crops. The wild birds might certainly be allowed to visit us for the summer season. It is pleasing to see many articles of domestic manufacture brought to the market for sale

by farmers and their wives and daughters; and all manufactured by themselves, at their own houses, from the produce of their farms, in wool or flax. It shows great industry in the female part of the agricultural class. They offer for sale very good Canadian cloth, flannel and linen—not superfine, but very suitable for country use, and for the use of the labouring class. The linen and flannel are very strong and good, and if the linen was bleached by themselves, it would soften its texture and make it much more valuable. This bleaching might be readily accomplished by the farmer's family, but perhaps it would prevent them having the linen to dispose of the same year that the flax is produced. We believe, however, that the higher value given to the linen would amply pay the interest of the amount invested in the linen for one year. The stockings, socks, and mittens they sell, are much better for country use, and for the labouring class, than what can be had in stores generally, with the additional recommendation of being lower in price. It is very desirable to encourage this industry, and it might be extended so much as to assist considerably the farmer's families, and almost all the work is executed at the slack time of the year, and at night. Store-keepers accustomed to buy these articles from the farmers, should instruct them, when necessary, to make the articles in the manner that would be most suitable for the uses that store-keepers retail them for. We do not see them offer any blankets for sale of home manufacture, and we think they might make them of much better quality and more lasting, than a large proportion of those imported. It is easy to calculate what profit a pair of good blankets would leave a farmer, by weighing a pair, and ascertaining what quantity of their own wool it would take to make a pair. Farmers in the old country, up to the period of our leaving home, scarcely ever purchased blankets, sheets, or any other articles that could be made from their own products. All their linen and flannel

goods, and most of the woollen cloth worn by them, was made in their own houses, except the weaving. They invariably found linen made and bleached by themselves was much better and more enduring than that made and bleached by manufacturers. Flannel goods they also found more durable when made by themselves, than any they could purchase. One cause of this difference was, that neither wool nor flax made use of by the farmer had the best portions taken out of them by manufacturers for finer fabrics. The farmers, on the contrary, made use of flax and wool of the best quality, as it came to them. The use of linen we should be glad to see, become more general instead of cotton, and for working men who use flannel shirts the Canadian farmers might supply a very suitable article. All these matters would have a great influence on the success of agriculture, and they are therefore entitled to the serious consideration of the readers of this Journal. We simply submit our idea on the subject, for others to improve upon it. However public manufactories may fail of success, those carried on in private families cannot cause much loss; and although the time and labour of the farmer's family may not be very richly rewarded, what is received is the reward of hours spent industriously, when, if they were not so employed, this time might be spent in idleness, or in expenditure of the farmer's means, which perhaps he could ill spare. The money gained by the sale of domestic manufactures, should be highly valued by the industrious families who make the goods disposed of, and they may rest satisfied it is highly creditable to them. The principal work of the farmers during the winter, is to attend to the farm stock, thrashing, and taking manure out to the fields, where required for use in spring. Doing this latter work in winter will greatly facilitate the spring work, and the manure if properly made up in heaps in the field, will not be so liable to be washed by water as if scattered about the yard. Fence

and fire wood should be provided, when the farmer can procure it—inleed every work that is possible to execute in winter should be done, to save the spring and summer season for work that cannot be executed in winter. We have been told that the country roads are difficult to travel upon this winter, in consequence of the great depth of the snow, and the roads not being tracked or made sufficiently wide for double, or even single sleighs to pass each other without great difficulty. This, we can very well believe, as some of the Turnpike roads in the neighbourhood of Montreal have been neglected and not tracked, or made sufficiently wide. It is much to be regretted when a law was passed for preventing any but carriages of a certain make to be made use of upon the roads in winter, that the same law did not provide that the roads should be made or tracked of sufficient width, or that double roads should be made. It is exceedingly difficult to travel in the country roads where they are not of the necessary width, and some change is required to be made in the law, either by the Legislature or by the Municipal Councils. The roads being too narrow for the carriages that are to be made use of upon them, is something similar in inconsistency, to a farmer having a stable built for his cattle and horses, and the doors made of so small size, that the animals could not pass through them.

This Agricultural Report is the first for this year, and we hope the season will be so favorable, that we shall be enabled to report of excellent crops, and that the farmers have done all that was incumbent upon them to have good crops. If we do our part well, we may confidently hope for favourable results, and that our skill, industry and attention will be crowned with success in an abundant harvest. Before we conclude, we would recommend farmers to provide themselves with good seed for the spring if they can obtain it, and to get it of unmixed varieties, particularly of wheat. Perhaps it would be well to try some of the

varieties of wheat that we were accustomed to grow in Canada before the ravages of the wheat fly. If sown early the experiment might be made, but we would think it very unsafe unless it could be sown early in April. In any case it might not be prudent to venture to sow more than a small quantity. We are unable to state as yet, whether there will be any new supply of Black Sea wheat imported in time for spring sowing, but any information we may obtain we shall give in this Journal.

There is some inconvenience incurred by farmers in having to put off to the latter end of May the sowing of wheat. The land being so long ploughed, (from the previous fall,) becomes hard, and is sure to have the roots of weeds and grass that are in it commence to vegetate before the wheat is sown. This cannot fail to injure the crop. The sowing of grass-seed with the wheat so late as the latter end of May, renders the grass-seed liable to failure, as it will not succeed well when sown so late, and exposed to the great drought of our summers. We have seen many failures of grass-seed, owing to this cause, and have heard complaints from many parties, of similar failures. When grass-seeds do not come up thick and well, it is a great disappointment and loss to a farmer. We would recommend that grass-seed should rather be sown with other grain, barley particularly, than sown with wheat after the middle of May. This matter is of some importance. It is a serious loss, after breaking up land to improve it for meadow or pasture, to have the grass-seeds fail in it, and have all the labour to do over again. There is, besides, the loss of a year generally. The farmer, expecting the grass to come up, does not wish to plough up the soil immediately; indeed the regular course of rotation is interrupted, and interferes very disadvantageously, where an improved system of husbandry is desired to be carried on.

January 29.

We would again solicit all subscribers to this Journal to pay up their subscriptions. The trifling amount of five shillings cannot be an object with any party who reserves it, and the subscribers are so very much scattered throughout the country that it would take a large percentage to send to collect it all. Where agents have been named, we beg they will send us returns of the subscribers, and of those who have paid. It is a waste of money to be addressing the journal to any parties who will not take it from the Post Office, or pay for it. As this may be the case with School Commissioners to whom it is addressed, that they do not in all places take it from the Post Office, the Journal will be discontinued to any School Commissioners who do not apply to the Society to have them continued for the use of the Schools. We particularly request of agents to make their returns of all who wish to have the Journal addressed to them, and to strike off any of the School Commissioners who they know do not take the Journal from the Post Office.

We have seen from our exchange papers that sowing mixed crops is advocated by parties who have made the experiment, and we have no doubt this mode might be advantageously adopted in many cases, particularly with beans, peas, indian corn, potatoes, carrots, parsnips, mangel-wurtzel and turnips. These grain and root crops might be very well cultivated in alternate drills, as all except turnips require early sowing and might receive the after culture and weeding without injury to any of the crops. The young turnip plants are said to be preserved from the fly by having barley or oats sown in every alternate row, and considerably grown up, previous to sowing the turnips. If the rows were not too far apart, perhaps it would be better when the turnip plants were safe from the fly, to pull up the barley and oat plants to feed the cattle and not allow them to go to maturity. In sowing beans, peas, and indian corn, they will succeed

well, with the roots we have named above in alternate rows; and there is no doubt that the soil will produce a greater weight of crop, than it would if any of these crops were cultivated alone. There is not much doubt that wheat or barley, sowed in alternate rows with root crops, might also succeed. The distance between the rows need not be great, as the wheat or barley coming to maturity long before the root crops would be taken up, would give the roots a much better chance to grow, the greatest difficulty would be to gather and harvest the grain crop without injury to the root crops. Experiment, however, would be worth making upon a small scale, to determine, whether mixed crops would succeed better, than if grown separately. It would appear to us that they must do so, as it is a well established fact, that different plants do not extract from the soil or from the atmosphere the same ingredients, or require the same for their perfection. We have seen a report of an experiment made with wheat, barley, and oats, sown in rows from $7\frac{1}{2}$ inches to 30 inches apart, and some broad-cast, and the former was found to produce the best grain, and the rows farthest apart the most weight of grain to the same quantity of land. We would strongly recommend farmers to make some experiments in this matter, on a small scale that would not injure them, and to report the result to us. Sowing in rows allows air to the crop, and this is most necessary to wheat and barley, both of which grains are scarcely ever sown in England except in rows in any good farming. The sowing machines are regularly hired out to sow for farmers by the acre, who have not a machine of their own, and this they do cheaply, and expeditiously. We do not expect to see this mode of sowing adopted generally in Canada for many years, but those who have means and opportunity might do a little in this way to show the advantage, if any, or to prove the disadvantage. We only offer suggestions to be acted upon by those who could afford to make a trial.

We should be sorry to lead farmers into expensive experiments, or to do anything that would be injurious to them.

Manure is of great consequence to the profitable cultivation of a farm—indeed no farm can be long cultivated to advantage that has not manure applied to supply the ingredients taken from the soil by crops. Every farmer may not have it in his power to apply a sufficiency of farm yard manure to keep his land in condition, but there is means of greatly augmenting the quantity of manure, by mixing that of the farm-yard with other substances, such as bog or moss, the cleaning from drains—and in fact any waste earth. The moss should be exposed to the air for some time before mixing with the dung, and when mixed, it should be suffered to remain for some time to ferment before applying it to the soil. Turning over the heap after mixing, once or twice improves the manure very considerably. Moss mixes better with dung than clay will, and is sooner fit for use. Moss, clay and lime, will, without any dung, make a good dressing for land, by mixing and turning over the heap several times. It should not be applied to the soil, however, until all the substances are thoroughly mixed and incorporated with each other. It is a very good plan to cover the farm-yard with moss, if to be had conveniently, after the manure is removed in the spring. Exposure to the sun and air, and the treading of cattle upon it, improves it very much for mixing with manure or with clay—and if lime was mixed with it, while remaining in this state, so much the better. There is abundance of moss to be had in Canada, but we are sorry to say it is not made much use of for manure, although, we believe, no substance in our power to obtain so cheaply, could be more advantageously employed for the improvement of our soil, both heavy clay, and sandy soil. Moss,

mixed with either of these, has a very beneficial effect. It opens the heavy clay, and it increases the fertility of the sand. Compost, in a proper state of preparation, is one of the best applications as a top-dressing for meadow or grass—but of course its value will depend upon the materials and management of the compost before it is made use of as top-dressing. In Canada, we think that in winter the liquid manure can be best preserved by littering the animals with straw abundantly—or by box-feeding where the animal will have the manure remain under it for several weeks furnishing litter to it daily. This plan is very suitable to our climate—so far as the saving of liquid manure. Warm stables, with a box for each animal of three years old and upwards, would, we have no doubt, pay the farmer for the extra expense. Any animal will do better and thrive better loose in a stall, than tied and confined in one position.

The best service we ever can render to our country is by endeavouring to improve its natural resources, and augmenting the amount and value of its productions. These are advantages we never could be deprived of, and would not depend upon our trade with other nations. It is by large and valuable productions of our own, we can obtain the certain means of trade and commerce with other countries, and the poor farmer who only raises a scanty produce annually, has little interest in the trade or commerce of Canada. A well stocked and productive farm, gives the owner a station and respectability in the community which cannot belong to him, while he has only an ill-stocked farm yielding a produce too scanty to afford himself and his family common necessities. It requires that a farm of 100 arpents should be well-stocked, well-cropped, and well-managed every way to produce sufficient for the comfortable support

of a family of the average number of individuals; and we believe this proposition will not be disputed. It may be imagined then, that an ill-managed and badly stocked farm cannot do much for an ordinary family, in providing them with what is considered necessary to constitute the comforts and conveniences of life. It makes a vast difference whether a farm should produce annually what was worth one hundred pounds currency, or two or three times that amount. It not only would make a great difference to the farmer and his family, but to the whole country, because it augments the whole means of the country for expenditure. We are not an advocate for the extravagant expenditure of a family or of a country, particularly an agricultural one, but means of expenditure to a reasonable extent is necessary for our comfort and happiness, and should be the constant ambition of every man to attain. We would be very sorry by any remarks or suggestions of ours to cause farmers to be dissatisfied with their situation, except so far as to induce them to improve their condition if in their power, and to offer them our humble advice how this is to be accomplished. They may rest assured that the publication of this Journal has no other object than the improvement of agriculture, the prosperity of farmers and of the whole country. We may be mistaken in many of our propositions and suggestions, but there cannot be any mistake in stating that it would be advantageous for every farmer to have his lands produce good crops and have suitable and good horses, cattle, sheep and swine. These advantages can only be obtained by sufficiently draining the soil first—cultivating it properly—keeping down every species of weeds in the crops—not allowing any plant to come to seed, but what is produced from the seed sown—keeping the soil in a state of fertility fit to produce good crops—and disposing of the produce judiciously. The farm

stock should be carefully attended to in breeding and feeding—no male animals kept entire more than to a few days old, except those required for breed—and having a good stock of agricultural implements for use.

At the great Smithfield Club Cattle Show held in December last, in London, it is said that the stock exhibited were generally superior to those of any previous Show. Although the cattle were not so *excessively* fat as at former Shows, they were considered better adapted for the food of man, and worth a higher price for the same weights. This was as it should be. The South Down sheep appear to have been the favourites. One lot was sold at the Christmas Market at £5 5s. sterling each. We have seen reports, that even the working men employed in Collieries of the North of England, who, heretofore, were accustomed to buy the fattest mutton of the Leicester sheep, reject this extremely fat mutton now, and buy in preference, meat that is of moderate fatness. Much money has been wasted in fattening cattle and sheep to excess. We do not say exactly by farmers, but by the public. Extreme fat in animals, may have cost at least one shilling the lb. weight, when if not made use of as food, it was only worth about three pence the lb. for making soap. In the Montreal Market, we have both beef, mutton, veal and lamb of sufficient fatness, and rarely too fat, and this will always be best for us. We do not pretend that the whole of these articles exposed for sale at our markets are of sufficient fatness, because they are not so; but there is constantly a good supply of good meat to be had in Montreal, and although some parties find fault with our beef and mutton as not being so well flavoured as that of the British Isles, we beg to differ with them. Our beef, mutton, lamb, and veal, when sufficiently fat, is exceedingly well flavoured, and seldom has that strong rank flavour, which these articles of food partake of so frequently in the British Isles from very

high feeding. Cattle or sheep, stall fed principally upon ground oats or barley, will always produce well flavoured and sweet meat—but of course the farmer who raises root crops will also feed them to his stock, and every farmer should raise some. Mixed food will be the best and most profitable, and keep the stock in better health than if fed on any one kind of food.

We give insertion to the communication of our respected correspondent, "An Upper Canada Farmer," on the subject of Lectures on Agriculture, which he recommends to be delivered in Montreal. We have always been anxious that some parties might be found to take up this matter, and deliver such a Course of Lectures in this city. Our correspondent is so favourably disposed towards us as to suggest that we should commence these Lectures. We are however, obliged to decline this honour, as we find sufficient occupation in editing this Journal, and acting in the capacity of Secretary to the Lower Canada Agricultural Society; and perhaps the subscribers to the Journal would think they have a sufficient share of our Lectures in the original articles published in it, without offering them any more in any other character. Our correspondent, we beg to propose, should commence these Lectures himself, and induce other parties to come forward and assist him to complete the Course. There should not be any difficulty in finding many competent men, in Montreal and the neighbourhood, to lecture on this subject, if they would condescend to do so, and take time to prepare and deliver lectures. We are confident that we can serve the cause more effectually by attending to the duties we have assumed, and endeavouring to make this Journal as useful as possible so far as we are capable of doing. Our correspondent, we hope, will give us credit for a sincere desire to advance the improvement of Canadian Agriculture, notwithstanding our declining to take any part in

delivering the Course of Lectures he proposes. We shall be very glad to copy into this Journal the Lectures that may be delivered on this subject by other parties. The subscribers will thus have the advantage of reading other lectures besides those we constantly have to submit for their consideration, and it will assist us in providing useful matters for the Journal.

The President of the United States appears disposed to give every possible encouragement to agriculture, as the principal source of the wealth of that country. Canada is most unquestionably as much, if not more, dependant upon her agriculture than the States of the Union. A few thousand pounds granted annually by the Legislature to Agricultural Societies to distribute as they may think proper, has not yet advanced very much the improvement of Agriculture, or the instruction of agriculturists where they most required it. The most of those who participate in the funds distributed by Agricultural Societies, are exactly the class or portion of farmers who are the best instructed in their business, and who require no stimulant to induce them to adopt improved modes of husbandry, being already aware of the advantage of doing so. What we require is to instruct and encourage as much as possible, that class or portion of farmers who never had an opportunity of seeing or knowing the advantages of better systems of agriculture than they practice. Agricultural Schools and Model-Farms, we believe, would be best calculated to promote the general improvement of Canadian agriculture. Would it not be desirable also, to have the interests of agriculture under the charge of a special Department of the Government, that would give it some importance in the estimation of the people? We may be in error, but we humbly conceive, there is not any Department of the Government of more importance to the welfare of Canada

than a Department specially devoted to agriculture would be ; provided it was ably filled, and efficiently conducted. France and Belgium have a Minister of agriculture. It is a matter of much more importance to every country to teach the people how to produce, than to appropriate the money after it is produced. A country rich in abundant productions is sure to be prosperous, while one that is not so cannot be made prosperous, until it becomes abundant in valuable production by all that Government or Legislatures can do for them.

At a late meeting of the Royal English Agricultural Society, the Report of the Council concluded in the following terms :—

“ The Council congratulate the Society on the improvements successively made each year in the various departments of its operations, and on the general recognition of the value of its influence, in animating and sustaining the cause of practical farming ; and they cannot entertain a doubt that, by the united exertions of all parties connected with agriculture, such a progressive improvement will be made in the alteration of the soil and the economy of British husbandry, as will promote the greatest production at the least cost, and thus be found contributing to the mutual interest of the parties more immediately concerned, and to the increased resources of the country.”

Such is the opinion of the benefits produced to English agriculture by the action of that great Society, and we believe they are fully justified in their conclusions. There have been greater improvements produced in English agriculture, and all that is connected with it, since the organization of this Society, a period of less than ten years, than for the previous century. In Canada, Associations are formed for the advancement of improvements in agriculture, and for other beneficial objects, but we constantly see them soon lose their interest with the public, and their objects seldom carried out with that degree of energy necessary to ensure their success. The same necessity that existed at the first

formation of these associations, and which induced their organization, continues to exist in full force, when a manifest indifference, nevertheless, appeared to influence the members, and check their useful action. This has been the cause of failure with many a Society formed in Canada for a beneficial object. Unless the members feel continually interested, there is not much good to be expected, however important the object of their first organization.

We have received a “ Descriptive Catalogue of Fruit and Ornamental Trees, Shrubs, roses,” &c., &c., cultivated at Andre Leroy’s Nurseries. Near the Rail-road, at Angers, Maine and Loire, France, 1849.

This Catalogue, both in English and French, may be seen at the Rooms of the Lower Canada Agricultural Society, 25 Notre Dame street, Montreal. An immense number and variety of ornamental and fruit trees, shrubs, and roses, &c., are described, and advertised for sale at very low prices indeed ; but the principal expense and difficulty is to get them from France to this country in a safe and growing state. If the proprietor of these nurseries would have a good variety brought out here under careful management, and at the proper season for transplanting, no doubt he might make a profitable business of it, but few parties here would venture to send to France for plants, that if not properly packed and taken care of on the voyage, might be worthless on their arrival. Any parties, however, who may desire information on the subject may obtain it at the Rooms of the Society, and see the prices charged for each species, and variety. We believe plants grown in France would succeed very well in Canada. As we before observed, the great difficulty is to be able to get the plants required out here in a proper state for growing, and without paying too high a price for their transport to this

country. We copy the following introduction to the Catalogue referred to :—

The sweetness of the climate of Angers, the fertility of its soil, its position near the junction of four large rivers and a rail-road, have made this city a place where every kind of cultivation is treated with the greatest care, and which has caused the city to be called "the Nursery of France." Every branch of Horticulture has there taken place to such an extent, that the Nurserymen formed, under the direction of the National Agricultural Society, a garden and school for instruction in gardening, in which exist a specimen of every kind of fruit-tree. The Society named a Committee for studying and classifying these fruits. When they are ascertained, cuttings are given to every Fellow of the Society. The organization and the extent of our establishment being very convenient, we have also formed, not only a school for the study of fruit-trees, but another for ornamental trees and shrubs, which stand the winter well in our climate. We have already collected about 1500 varieties of fruit-trees of different kinds. The largest number have fruited, and the fruits have been tasted, drawn, and described with the greatest attention. This operation procures us the means to furnish with a guarantee all the varieties described upon our Catalogue. As to those where the columns are blank, and which are of the largest number in the category of the new species, we will furnish them as we have received them, without guarantee. We could have filled those blanks in making the description from other books; but we have preferred to wait until those species have fruited in our Nursery. Those kinds so ascertained have farther the great advantage to give always sure cuttings for the propagation, and could compare with the divers varieties that we receive under different names, though being the same.

We have established, from our experience, and the best pomological works from France, Belgium, and those of the Horticultural Society of London, a synonymize, which became necessary for avoiding the repetition of the same species under different names.

In order to aid the purchaser in the choice of the kinds, and put it in his power to form a list of good fruits, the ripeness of which succeeds each other, we have indicated on our Catalogue the quality, size, texture, use, and the season of maturity; and farther, the fertility of the kind, and the form under which it grows best: finally, we have added some remarks as respects their modes of vegetation or other peculiar circumstances.

We have explained under every kind of fruit the meaning of the columns and abbreviations. Persons who address us with orders are respectfully requested to indicate very exactly under

what form they desire their trees; that is, if they are for standard, pyramid, greenhouse, or for wall. The trees will be packed and shipped with the greatest care, and the expense will be added to the account of the purchaser. The charges of the voyage, insurance, and all risks and perils, are also on the account of the purchaser.

In case of damage, the reclamations ought to be addressed to the Agent charged with the transportation.

TERMS:—Six months, on a bill of exchange, accepted by a bank, at Paris, Havre, or Liverpool.

ADVICE: If the trees arrive during the frosts, they should be put under cover, and not unpacked till after thaw; if they are dry, lay them down in a hole, covered wholly with earth, water them much, and keep them so during five or six days. By this means, dried trees will be restored to health.

NOTICE: In the orders that may be addressed to us, in order to avoid copying the names of the species, only state the number and quantity of each sort.

We have seen a very simple recipe for preventing rats or mice in stacks or barns of grain, which we give below. We cannot answer for its being a perfect remedy against them, but it is not expensive to try the experiment, and it will not injure the grain or straw :—

"Take one pound of nitre or saltpetre, and one pound of alum, dissolve them together in two pints of spring well-water, get a firlo of bran and make a mash thereof, putting in two pints of the above liquid, and mixing up all together. When you build a stack, every second course, take a handful or two of the mixture and throw upon them till they come to the easing—allowing your stacks to stand twenty years, rats or mice will not come near them."

Another receipt:—

"Make a paste of flour, a few sweet almonds powdered fine, and a little treacle, add a few drops of oil of aniseed, and to a pound of paste, add about a tea-spoonful of carbonate of barytes, make small holes in pieces of turf fuel, put in a small portion of the paste, and run in the pieces of turf here and there all round the stacks; examine them twice or thrice during the season, and renew them when the paste is consumed."

EFFECTS PRODUCED BY THE RAINS AS THEY DESCEND THROUGH THE SOIL.—1st. *It causes air to be renewed.*—It is believed that the access of frequently renewed supplies of air into the soil is favorable to its fertility. This descent of air

the rain promotes. When it falls upon the soil, it makes its way into the pores or fissures, expelling, of course, the air which previously filled them. When the rain ceases, the water runs off by the drains, and as it leaves the pores of the soil empty above it, the air follows and fills with a renewed supply the numerous cavities from which the descent of the rain had driven it. Where land remains full of water, no such renewal of air can take place.

2nd. *It warms the under soil.*—As the rain falls through the air, it acquires the temperature of the atmosphere; if this be higher than of the surface soil, the latter is warmed by it, and if the rains be copious and sink easily into the subsoil, they will carry this warmth with them to the depth of the drains. Thus the under soil in well drained land is not only warmer, because the evaporation is less, but because the rains in the summer season actually bring down warmth from the Heavens to add to their natural heat.

3rd. *It equalises the temperature of the soil during the season of growth.*—The sun beats upon the surface of the soil, and gradually warms it; but even in summer, this direct heat descends only a few inches beneath the surface. But when the rain falls upon the warm surface and has an easy descent, as in open soils, it becomes itself warmer and carries its heat down to the under soil. Then the roots of the plants are warmer, and general growth is stimulated.

It has been proved by experiments with the thermometer, that the under as well as the upper soil is warmer in drained than in undrained land, and the above are some of the ways by which heat seems actually to be added to drained land.

4th. *It carries down soluble substances to the roots.*—When rain falls upon heavy undrained land, or upon any land into which it does not readily sink, it rises over the surface, dissolves any soluble matter it may meet with, and carries it into the nearest ditch or brook. Rain thus robs and impoverishes such land; but let it sink where it falls, and if it dissolves anything, it will carry it downwards to the roots, will distribute uniformly the saline matters which have a natural tendency to rise to the surface, and will thus promote growth by bringing food everywhere within the reach of plants.—*Johnston's Agricultural Chemistry.*

CAUTION TO POULTRY BREEDERS.—Perhaps it may not be generally known that if chickens, fowls, or ducks eat a quantity of new vetches, it will inevitably cause death. A case of this kind occurred a short time ago at Mr. Thomas Lane's, of Radford, in this county, which swept away a large quantity of young fowls. Mr. Lane had been thrashing some vetches with the machine, and the straw, being very good, was put on two waggons to be drawn and made into

a stack; but a heavy rain falling in the meantime, which penetrated through the loads, it was obliged to be thrown into the yard. The straw had some loose vetches mixed among it, which were made soft by the rain, and of which the fowls partook plentifully, and this caused the death of upwards of 100 very fine fowls. On examination after death their gall-bladders were found to be much swollen and surcharged. Old vetches are not supposed to be deleterious.—*Worcester Chronicle.*

Mrs. Fry's Rules.—1. Never lose any time. I do not think that lost which is spent in amusement or recreation some time every day; but always be in the habit of being employed. 2. Never err the least in truth. 3. Never say an ill thing of a person when thou canst say a good thing of him; not only speak charitably, but feel so. 4. Never be irritable or unkind to anybody. 5. Never indulge thyself in luxuries that are not necessary. 6. Do all things with consideration, and when thy path to act right is most difficult, feel confidence in that Power alone which is able to assist thee, and exert thy own powers as far they go.—*Memoir of Elizabeth Fry.*

DESCRIPTION OF A FARM-YARD AND FARM BUILDINGS.—I have drained and subsoiled, at my own expense, 150 acres of my farm, the whole of which, amounting to 800 acres, I am in progress of fencing and dividing into 15 and 20 acre fields, on the highest point of which I have built a farm-yard, which gives accommodation to 15 working horses, 126 cows, for the pail and butcher, 300 sheep, 50 pigs, with all that follow them. The yard forms a parallelogram, and being on the slope of an eminence in the farm, the lower or ground story has been excavated—that is, I had 4,097 cubic yards of cutting to make the yard even; the haggard is, therefore, on a level with my barn-loft, which is 114 feet long, 18 feet wide, and 12½ feet high, to the wall-plate, on the north side of which is my thrashing-machine; so that I thrash on one loft, winnow on the one underneath, and drive the chaff into a third house which adjoins the granary, and all is done at the same time, by four horses. From the north side of the barn runs east a straw loft, 127 feet long, over dairy, piggery, and fowl-house; and at the opposite side runs a hay-loft, over stable, cow-houses, &c., of equal dimensions; so that a horse and cart can, from the haggard, enter the barn, and traverse a loft of 127 feet east, 114 feet south, and 127 feet west again, the floors being made of such materials as to bear, without injury, the heaviest load a horse can carry, and all covered in with the best Queen slates. This will give Mr. Friar an

idea of my farm-yard, out of which, and to the south is my manure-pit, ten feet lower than the farm-yard, and into which, by means of conducting drains, all the liquids are conducted, and at the lowest point of which is the manure-pump. Farmer's Gazette.

GOVERNMENT ENCOURAGEMENT TO AGRICULTURE IN BELGIUM.—The Belgian Government has taken measures to propagate in the country the methodical improvement of the land by means of subsoil drainage, which has latterly been found so beneficial in England. Machines have been constructed and conveyed to different points of the kingdom for the manufacture of the tiles necessary for carrying off the water, as well as the tools required for the construction of the trenches. A complete treatise on drainage has been written, and will shortly be published. Lastly, an engineer (M. Leclerc), from the first School of Civil Engineers of Ghent, has been sent into this country to study all the details of the new system; after a sojourn of some months this officer has just returned to Belgium, furnished with all the necessary knowledge; he will be in communication with all landowners or farmers who may desire to make trial of his plans. A decree issued by the Minister of the Interior regulates the conditions under which the works are to be carried on. A society has been formed to demonstrate the good effects of subsoil drainage, to enable proprietors more easily to construct the works, and to collect information treating of the new system; some of the richest landed proprietors have already enrolled their names as members. The Minister of the Interior has placed M. Leclerc at the disposition of this society.

SEX OF EGGS.—A correspondent of the *Agricultural Gazette* says:—"I am induced to tell you that, without pretending to any knowledge of abstruse mysteries, I have learned to discover which eggs will produce pullets, and have pursued the practice through this season with uniform success. It consists simply in this—to avoid setting the long shaped eggs, which always produce cocks, choosing the rounder and plumper ones. Generally, too, I have found that the very largest eggs produce male birds. I select, therefore, the most promising rounder shaped eggs, without taking the very largest. It is certainly an important matter to succeed in this department, having myself often had the mortification to have a whole brood of cocks, or nearly so; the avoidance of this inconvenience is truly a desideratum."

HINTS ABOUT FIRE.—In case of fire, whatever may be the heat of the moment, keep cool; let

nothing put you out, but find something to put out the fire; keep yourself collected, and then collect your family. After putting on our shoes and stockings, call out for pumps and hose to the firemen. Don't think about saving your watch and rings, for while you stand wringing your hands, you may be neglecting the turn-cock, who is a jewel of the first water at such a moment. Bid him, with all your might, turn on the main.

SMOKY CHIMNEYS.—A correspondent of the *Builder* says—"I have built many chimneys in all possible situations, and have found one simple plan everywhere succeed, the secret being only to construct the throat of the chimney, or that part of it just above the fire-place, so small that a man or boy can scarcely pass through. Immediately above this, the chimney shaft should be enlarged to double its width, like a purse, to the extent of about two feet in height, and then diminish again to its usual proportions. No chimney that I ever constructed thus smoked."

SONG OF THE PLOUGHMAN.

WRITTEN AT THE REQUEST OF ONE OF THE MEMBERS
OF THE TRAFALGAR AGRICULTURAL SOCIETY.

See the morning breaks away,
Waken ploughman to your toil;
From early dawn till gloamin' grey,
Guide the plough and turn the soil.

Draw the furrow long and deep,
Scatter widely—never spare;
Let the harrow o'er it sweep—
The faith of future bread is there.

Nature now her aid is bringing,
Green the dewy braird is springing;
Hear the lark above it singing—
The faith of future bread is there.

The summer sun all brightly glows,
Diffusing life and joy around;
The genial showers so mildly flow,
Imparting freshness to the ground.

On lowly strath, on rising bank,
The ploughman's fostering care we find;
Where fertile fields, so strong and rank,
Charm the eye and cheer the mind.

Cattle on the lea are feeding,
Fleecy flocks the hills are cleading;
Beauteous flowers their blossoms spreading,
Charm the eye and cheer the mind.

'Tis autumn, and like burnished gold,
All radiant shine the treasure-fields;
How fair the prospect to behold—
What precious promises it yields.

An empire views with grateful eyes,
And harvest songs afar resound;
Behold the ploughman's glorious prize:
See all his toils with blessings crowned.

Myriads to his aid are flying,
Reaper bands their sickles plying;
Sheaves and shocks behind them lying,
See all his toils with blessings crowned.

May plenty fill the rural hall,
And honoured be its owner's worth.
At morning's rise, at evening's fall,
Be love and joy around the hearth.

While workshops jail their sickly bands,
Engaged in competition's strife,
The ploughman, with judicious hands,
Wields the stay and staff of life.

Unmoved he hears what crowds are saying,
Of battles fought, of foemen slaying;
But on the plough his powers laying,
Wields the stay and staff of life.

JAMES PRINGLE.

Craigmill, October, 1849.

FARMING IMPLEMENTS.

WE, the undersigned, certify that we have carefully inspected a variety of Farming Implements manufactured by Mr. A. Fleck of St. Peter Street, and we feel great pleasure in recording our unqualified opinion that they are very much superior to any article of the kind which we have seen manufactured in the country, and equal to any imported.

And we would particularly recommend to the notice of Agriculturists throughout the Province his Subsoil Grubber, which he has improved upon from one which took a premium of £10 from the Highland Society of Scotland. This implement seems well adapted to improve and facilitate the labours of the Farmer, and we cannot doubt that it will soon be extensively used in improved cultivation. His Scotch and Drill Ploughs are also very superior, and well worthy of the inspection of every one desirous of possessing a valuable article.

M. J. HAYS, Cote St. Antoine,
President M. C. Agricultural Society.
P. P. LACHAPPELLE, Sault au Recollet.
WM. EVANS, Sec. L. C. Ag. Society.
JAMES SOMERVILLE, Lachine.
EDWARD QUINN, Long Point.
T. E. CAMPBELL, Major, Civil Secretary.
HUGH BRODIE, Cote St. Pierre.
P. F. MASSON, Vaudreuil.
JAMES ALLAN, Pointe aux Trembles.
GEORGE CROSS, Durham.

CANADIAN GLASS MANUFACTORY,

NEAR SNYDER'S LANDING, VAUDREUIL,
*Erected and carried on by Messrs. Boden
& Le Bert.*

THE Proprietors of this establishment are prepared to Manufacture LOOKING GLASS PLATE and WINDOW GLASS, of every size, coloured and fancy, according to patterns or orders. Shades for Oil and Gas Lamps, plain, tinted, or coloured, in the richest hues—Coloured Glass of any pattern for Churches, similar to those of European Churches; also, for Cottages, Gardens, Houses, and Steamers—Bottles and Vials for Druggists made to order.

—ALSO,—

SODA, GINGER, and ROOT BEER BOTTLES, with or without the maker's name.

—AND,—

MILK CANS, of suitable sizes.

All these articles shall be of the very best quality and disposed of on reasonable terms; and the proprietors solicit a share of public patronage, and the examination of their Manufactures.

For orders or further particulars enquire of the proprietor, at the People's Hotel, No. 205 and 207, Notre Dame Street, Montreal.

Vaudreuil, January, 1850.

AUCTION SALE OF FRUIT TREES, &c.

THE undersigned is authorised by the Proprietor of ROSEBANK NURSERY to state, that, as early after the opening of the navigation in spring as possible, there will be a Sale by Auction, in this City, (similar to that which took place this fall) of Apple Trees, a fine assortment of suitable named sorts.

Pear	do	do	do	do
Plum	do	do	do	do
Cherry	do	do	do	do

TOGETHER WITH

Raspberry Bushes, Strawberry Plants of fine named sorts, Roses, and various Ornamental Trees and Shrubs.

The healthy condition of these Trees and Plants, and the accuracy of their names, may be depended upon, and the sale will take place in good time for subsequent spring planting, which is the safest, at any rate, in all northern climates.

JOHN DOUGALL,

Montreal Witness Office.

Agent for Rosebank Nursery.

Montreal, November 30, 1849.

REAPING MACHINES.

THE Subscriber has on hand three REAPING MACHINES of the latest and most improved construction, capable of cutting twenty-two acres per day. Being manufactured by himself, he is prepared to warrant both material and workmanship as of the best order. Price moderate.

MATTHEW MOODY, Manufacturer.

Terrebonne, July, 1848.

FLOWERS AND FLOWERING SHRUBS.

FOR SALE at ROSEBANK NURSERY, near Amherstburgh, Flowers and Flowering Shrubs, consisting of the largest collection of choice named Tulips, on this Continent, at very reduced rates. A very fine collection of Double and Single named Hymeniums, of all colours and shades. A large assortment of choice new Dahlias, Roses, comprising many of the finest varieties of Hardy June, Moss Bourbon, Perpetual, Hybrid, Noisette, Bouxalt, Bengal, and Tea Roses, &c., &c., at very low prices. Pœnias—Tree and Herbaceous, as well as nearly all the choicest flowering shrubs, and Perennial Flowers, Bulbus and Herbaceous, can be supplied. Flower seeds, of the best kind, for sale. Orders by mail, or left at the *Witness* Office, Montreal, will be carefully attended to, and forwarded with despatch.

JAMES DOUGALL.

November 30, 1849.

ROSEBANK NUSERIES.

NEAR AMHERSTBURGH, CANADA WEST,

THE PROPRIETOR has for Sale, a most extensive assortment of FRUIT TREES, comprising all the desirable and leading varieties, and including all the kinds recommended as first-rate at the Pomological Conventions at Buffalo and New York, last Fall,

Apples a 1s. 3d. each, or \$15 to \$20 per 100;
and by the 1000 at very reduced rates.

Pears on Quince and free

Stocks..... a 2s 6d. ea., or \$40 per 100
Peaches, an unrivalled

assortment..... a 1s 3d ea., or \$20 do

Plums, 74 varieties, a 2s 6d ea., or \$40 do

Cherries..... a 2s 6d ea., or \$40 do

Nectarines..... a 1s 10½d each

Apriots on Plum and Apricot

Stocks..... 2s 6d each.

Quinces..... 1s 3d to 1s 10½d each.

Foreign Grapes..... 2s 6d ea, 2s.6d per doz

Native do, 1s 10½d ea., 15s do

Gooseberries..... 1s each, 10s do

nts Cran and Raspberries, Strawberries, Almonds
Chesnuts, Filberts, Mulberries, &c., of all the best
kinds, and at very reduced rates.

Specimen Trees of every variety cultivated have been planted out, which are mostly in a bearing state, and from which the scions have been cut, offering a guarantee for the accuracy of the kinds, which few nurseries possess; in evidence of which the Proprietor received the first premium for Foreign Fruits at the New York State Fair at Buffalo, as also nearly all the first premiums at the Detroit Horticultural Society's Exhibition, during the season.

Persons unacquainted with fruits would be better supplied, both as regards size of trees and quality of fruits, by leaving the selection of varieties to the Subscriber, merely mentioning the number of Summer, Autumn, and Winter varieties required, and any other instructions they may think requisite as to size of fruit, &c.

The Trees will be carefully packed, so as to carry any distance with perfect safety, a small extra charge made for packing. Orders should be sent by 1st March, so as to ensure a good selection being got, and also that they may be forwarded by the first conveyance.

The Propeller EARL CATHCART plies regularly

between Amherstburgh and Montreal, touching at the intermediate ports.

Trees, when taken up early, can be safely planted any time in April or May.

Orders may be left at the *Witness* Office, Montreal.

JAMES DOUGALL, Proprietor.

Rosebank Nurseries, near Amherstburgh,

20th November, 1849.

NEW SEED STORE.

THE Subscriber begs to acquaint his Friends and Customers that he has, under the patronage of the Lower Canada Agricultural Society,

OPENED HIS SEED STORE,

At No. 25, *Notre Dame Street*, Opposite the *City Hall*, Where he will keep an extensive assortment of AGRICULTURAL and GARDEN SEEDS and PLANTS of the best quality, which he will dispose of on as favourable terms as any person in the Trade. From his obtaining a large portion of his Seeds from Lawson & Sons, of Edinburgh, who are Seedsmen to the Highland and Agricultural Society of Scotland, he expects to be able to give general satisfaction to his Patrons and Customers. He has also made arrangements for the exhibition of samples of Grain, &c., for Members of the Society, on much the same principle as the Corn Exchanges in the British Isles. He has a large variety of Cabbage Plants, raised from French seed, which he will dispose of to Members of the Society, at one fourth less than to other customers.

GEORGE SHEPHERD.

Montreal, April, 1849.

NOTICE—Some excellent Barley and Oats for sale, for seed, the produce of seed imported expressly last Spring from Britain—Samples to be seen at Mr. Shepherd's Seed Store.

Montreal, January, 1850.

Agents for the Agricultural Journal.

H. Aylmer, Esq.,.....Melbourne and Ship.
Capt. Stewart.....Clarenceville.
R. J. Robins, Esq.....Pointe à Cavignol.
Rev. F. Pilote.....College of St. Anne.
Dr. Grosbois, M. D.....Chambly.
Dr. J. H. R. Desjardins.....Green Island.
Dr. Conoquy.....St. Césaire.
Dr. De la Brûère.....St. Hyacinthe.
Mr. T. Dwyer.....St. Pauls, Abbotsford.
Paul Bertrand, Esq., N.P.....St. Matthias.
Thos. Cary, Esq., (Mercury).....Quebec.
Dr. Smallwood.....St. Martin, Isle Jesus.
Robt. Ritchie, Esq.....Bytown.
Major Barron.....Lachute.
L. Guillet, Esq.,.....Three Rivers.
Hon. F. A. Malhiot.....Verchères.
J. B. E. Darocher, Esq.....St. Charles, Chambly.
A. C. Cartier, N. P.....St. Antoine.
John McLarren, Esq.....Murray Bay, Sag.

All communications connected with this Journal, to be addressed, post paid, to the Secretary of the Society—WILLIAM EVANS, Montreal.

Annual Subscription for the Journal, five shillings.

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AGRICULTURAL JOURNAL,

AND

TRANSACTIONS

OF THE

Lower Canada Agricultural Society.

VOL. 2.

MONTREAL, MARCH, 1880.

NO. 3.

No country can ever exhibit any signs of "ruin and decay" whose fields are well cultivated, producing clean and excellent crops, whose pastures are covered with good herbage, and stocked with a good and suitable description of animals of every variety required, ample meadows to afford winter food for these animals, convenient and well constructed farm buildings, and a sufficient variety of suitable agricultural implements of the best description. If this were generally the case in Canada there could not be any signs of "ruin and decay" in either town or country. It is such a prosperous state of the country and her agriculture, that would re-open the stores that are closed, and tenant the houses that are now empty, in our cities, and we feel persuaded that those who expect to re-open stores, and tenant empty houses by any other means than by the improvement of the agriculture of the country, will be disappointed. Every country must create its own means of expenditure, unless they find some other country to bestow them the means. This is a fact that cannot be too generally known, or too well understood, and all the philosophy, and political economy in the world, cannot disprove it. It would require a long explanation to show how this is the case directly and indirectly. The amount of the income of individuals from other countries, and that brought by emigrants to Canada, is an exception to this general rule, both of these not being created in this country, and may be expended here, but this amount is not very considerable, although a great advantage so far as it goes, to increase the real annual income

of the country. However capital may be employed, it cannot fail to be useful. It may not be profitable to the individuals who expend it, but after it passes from their hands, it may go into channels that will make the very best and most profitable use of it for the country. The mode of employing capital is of very great consequence as regards the general benefit it may produce to a country; when directly and judiciously employed in creating a new produce, it must be infinitely better than by any less direct mode. By direct application to production, a new value is created at once, and the money expended for its creation has already gone into new channels of employment. The improvement and prosperity of agriculture is retarded and checked, because it has to wait for capital, until it creates it, or accumulates it from a surplus. Hence it is, that a farmer may wait all his life for the necessary capital to effect improvements that would double his annual production. There are some parties who have overcome these difficulties, but it is only when they have great energy, perseverance, and a good idea of their business. It is almost impossible for ordinary farmers, on worn-out and exhausted farms, to improve their condition without some means to commence with. The amount might not be large that would enable them to better their condition very soon, but something is required, and for this purpose, and to supply this want, we have suggested the expediency of introducing "Associations of Agricultural Credit" in Canada, which would benefit every class by the general improvement it would produce.

MESSRS. NESBIT'S ACADEMY, KENNINGTON, LONDON.

In the month of December last, a numerous company of ladies and gentlemen assembled at the above establishment, to witness the examination of the pupils, and the chair was taken by Wm. Shaw, Esq., Editor of the Mark Lane Express, the true friend of Agriculture, supported by many other gentlemen connected with agriculture and science.

The Chairman, after some preliminary remarks, said:—

But I am sensibly impressed with the conviction that we are not at all times to consult our own feelings, but that, as citizens of the world, it is incumbent upon us to take upon ourselves any duty which we can perform, assuming, of course, that its performance is calculated to promote the general good (cheers). Mixed up as I have been all my life with agricultural pursuits, there is no occasion on which I could be called to take part in the proceedings of an evening like this, without a feeling of high gratification; for I consider that in agricultural, as well as in other pursuits, a vast deal depends on the first moulding of the human mind; indeed, I have ever been of opinion that the shortest course to an improved cultivation of the soil is that which begins with the cultivation of the mind; and I am exceedingly glad that Mr. Nesbit has set an example of that course of action, which I believe to be the best adapted and most likely to introduce a better system of education in reference to agriculture. (Hear, hear.) I know that there has been established a seminary of education, entitled the Cirencester Agricultural College; and a friend of mine, who is a zealous supporter of that institution, is present on this occasion. I, for one, rejoice in the establishment of that college, as I rejoice in the establishment of any institution which is calculated to promote sound education: but it has ever been my conviction, in respect to the effecting an improvement in the cultivation of the minds of youths who are intended for the pursuits of agriculture—I speak of improvement in relation to their peculiar business—that the only chance of attaining that object was by the introduction of a new, an improved, and a better system, specially adapted to that particular object, into the schools in which youths are now educated. (Hear, hear.) We have not yet arrived at that point when we can induce the tenant-farmers of this country—and I would go beyond tenant-farmers—I would desire to include the sons of landlords in the improved sys-

tem of instruction (Hear, hear.)—I say, we have not yet arrived at a period when we can induce farmers to send their sons to new establishments. We must bring information home to their doors, instead of sending them to other and new institutions to obtain it—(Hear, hear.)—and I believe that the best and only mode of doing this is by seeking to bring about a system of education especially adapted to their pursuits, in those schools throughout the country to which they are in the habit of sending their children to be educated. In this way, we shall be setting into motion a thousand established seminaries for improved education for one new one, even if we could succeed in inducing some farmers to send their children to any such new institutions, (Hear.) In these days a great deal of interest is attached to the education of the future agriculturists. From a variety of causes agriculture has become, I may say, the topic of the day. And really it is not surprising that it should be so; on the contrary, it is astonishing that it has not been so long since, inasmuch as you may trace almost every important article which we daily use and enjoy, to the soil for its origin. We do not sufficiently reflect what a large proportion of the articles which we consume, whether as food or otherwise, are derived from the soil, and may therefore be correctly termed agricultural products. While we speak of the food which is raised for our sustenance, and of the wool with which we are clothed, we forget, perhaps, that coffee, sugar, and cotton are also articles of agricultural produce, and which we regard now as necessities of life; and if you scrutinize the various other articles which enter into our clothing and our food, you will find that by far the greater proportion of them may with propriety be called purely agricultural. At the present moment the education of the future farmer is a subject of redoubled interest, because there is a prospect of our being placed in a situation different from that which we have heretofore occupied. Whatever may be our respective opinions with regard to a certain question which it would not be right to introduce on this occasion, it is, at all events, quite certain that under any conceivable circumstances it is highly desirable that every available appliance should be used to improve the mind of the future farmer, and to enable him to apply the principles of those sciences, a knowledge of which, although it can never be sufficient alone to make a good practical farmer, must, in combination with practice, prove exceedingly valuable. (Hear, hear, and cheers). Without implying for a moment that the practical farmer ought to become so scientific as to vie with the chemists of the day, it appears to me that it cannot be denied, with respect to chemistry, botany, and geology, that it is highly desirable that the youthful mind should be imbued with the prin-

ciples of those sciences ; and that, once in the possession of such knowledge, he will be enabled in after life to apply it to the practice of agriculture (cheers). Now it is to such objects, in addition to the ordinary routine of education, that the Messrs. Nesbit especially direct the attention of their pupils. Many of you, no doubt, heard last year a report of the success which had attended the system adopted up to that period. I have had an opportunity of looking at the questions which have been propounded to the pupils, in the several departments of instruction this year ; and I must confess that when I read them I felt sensibly my own insignificance, from the consciousness of my utter inability to answer any of the questions, but certainly not more than here and there one (laughter). I therefore feel that there is being implanted in the minds of the youths placed under the tuition of the Messrs. Nesbit, principles of knowledge which are possessed by few at so early an age ; and it is impossible to doubt that the seeds of sound education thus sown in the minds of the pupils will produce hereafter a plentiful crop of intelligence (cheers). It would be improper in me to dilate further on the proceedings of the evening. I will only, in conclusion, express a hope that you will extend to me the kindness which was so readily accorded to my predecessor in the office of Chairman last year, and of which I stand so much more in need than did that gentleman—(cheers).

Mr. Nesbit, in returning thanks for the approval of his system of education, said :—

Mr. Chairman, ladies, and gentlemen, as the proceedings of the evening have nearly terminated, perhaps you will not take it amiss if I now address to you a few observations on the general subject of education (Hear, hear). It is a subject which has engaged my attention for a number of years. My father has been occupied in the work of instruction for about fifty years ; having been brought up with him, and having very early in life chosen his profession for my own, I soon perceived the necessity for a change in the old system of tuition ; and I have endeavoured as far as possible to bring it into the shape which is most consistent with the powers of man, and with his position in the world (cheers). I maintain that in this country, which depends for its political position upon trade, arts, and manufactures, a system of education which leaves untouched the nature and history of the substances which abound around us is not a proper education. I hold that reading and writing are merely means of acquired education (hear) ; and that if a person have acquired the power of speaking and writing two or three languages, he is not therefore to be termed an educated man ; he has, so

far, only got the means of acquiring information (Hear, hear). I have endeavoured since I came to the metropolis to carry out these views. We have had many examinations, conducted by parties quite independent of myself, in chemistry, geology, botany, and mathematics ; and though we teach, I believe, as well as they are taught in most schools, the ordinary branches of a good education, including the dead languages ; we have chiefly brought under your notice those points of our system in which this school differs from most other educational establishments. We have proved it possible to give a knowledge of chemistry, geology, botany, and mathematics, without trenching at all on other parts of education. It may now go forth to the country, as the result of our own experience during a long series of years, that it is quite practicable to engraft on the common system of education in this country, a higher and more extended system, and to combine the two. No one can doubt that where the two are combined the education given will make those who receive it, better able to cope with the difficulties which they meet with than they otherwise would be. If they become farmers they will possess a knowledge of the composition of the land, and the nature of crops and manure ; if they become miners they will understand minerals, and be able to analyze substances without being dependent on a chemist ; if they should be engaged in dyeing processes, or in the arts of manufacture, they will have the means of determining what wash liquors contain, and what materials they ought to buy. Thus I might proceed through all the pursuits to which pupils may devote themselves after the completion of their education. But, higher than all this I wish to place before you the influence which this course of instruction must produce on the human mind ; higher than all this, I say, is its influence in developing the faculties of the human mind, and affording food for thought when the reflective faculties have become developed (cheers). I hold that the best system of education is that which supplies the mind of youth with the greatest number of facts, because, without facts there can be no play of the reflective faculties. This is the kind of education which I have endeavoured to convey ; how far I have succeeded you will judge from the examination which you have witnessed this evening. I have endeavoured to show that we have effected our object, and if all the schools throughout the kingdom would pursue the same course, I am convinced that the result would be most beneficial to the country. I should be exceedingly glad to give to any party who is engaged in the business of education any information which I can convey as to the peculiar methods and plans which I have adopted in conducting this academy (cheers).

At the conclusion of the meeting, the Chairman, Mr. Shaw, again observed:—

It had been his lot, as a boy, to receive just that exclusively classical education which had been described that evening; and the result was, that on going into the world he found himself ignorant of almost all that species of knowledge which was requisite for business purposes (Hear, hear). It was certainly astounding that up to that period it had not been considered necessary to fit men for the practical duties of life until after they had left the Universities, and, as the phrase ran, had completed their education (Hear, hear).

From the proceedings, we may perceive how the people of England view the subject of a suitable education for agriculturists, and how essential they conceive it to be to all who engage in the business of farming. Indeed, it is impossible that farmers can have the same chances of success with other classes, without receiving a suitable education for their particular business. It is truly a matter of astonishment that this discovery should not have been made sooner than in an advanced period of the nineteenth century. Youth intended for every other business or profession, except that of farming, are suitably educated and instructed, but for farming it was not thought necessary that they should receive from books the slightest information relating to the business of their future life. Matters are changing now, and we hope they will continue to change until the principle is generally established, that an agricultural education is necessary to be given to every young farmer. We give a letter from Mr. Nesbit, showing that he also takes his pupils to visit the country, in order better to explain the subjects he teaches in his school:—

THE ANNUAL EXAMINATION AT MESSRS. NESBIT'S ACADEMY.

To the Editor of the Mark Lane Express.

There are certain points connected with our system of instructing, which, though not particularly alluded to at the examination, are nevertheless so important that I wish to place them prominently before our friends and the public.

A great deal is spoken in the present day respecting *theory or science versus practice*. It is

not generally understood that a *really scientific* education is a *practical* education.

In teaching our pupils geology, for instance, we have not been content with merely giving dry details and exhibiting a few fossils. We have given opportunities to our pupils to study this science by visiting localities where different soils are the best developed and the most easily examined.

To illustrate our labours in this direction during the past year, I may mention the places we have visited. Last Easter we took a number of pupils into Dorsetshire. Hammer in hand we inspected the *lais* at Lyme Regis, and extended our observations along many miles of the coasts, where the strata, cut off by the sea, offer beautiful natural sections. We visited the Isles of Portland and Purbeck; and in the course of our tour examined nearly all the strata from the tertiary to the *lais*. The specimens collected have been subjected to chemical analysis, and the results have yet to be communicated to the public.

In May, we, accompanied by our geological professor, took about five and twenty pupils to Reigate, in Surrey; and examined carefully, in that district, the whole of the soils from the chalk to the weed; including a visit to the quarries of *freestone* at Godstone.

We subsequently spent three days in the neighbourhood of Folkestone, Hythe, and Dover; got a very good idea of the soils of the neighbourhood, and obtained many fossils.

We also visited different cuttings on the North Kent Railway, and likewise obtained many fossils.

In the autumn of this year myself and fourteen of my pupils paid a visit to the North of England. We spent a week in looking over the mining districts of Derbyshire. We saw Dove Dale, Haddon Hall, and Chatsworth; viewed Castleton, with its "Castle of Peveril on the Peak;" ventured into all the great natural chasms and caverns of the district; and finally wended our way through the romantic woodlands of Derbyshire to the city of Manchester. We employed a week in inspecting the manufactures of this "Metropolis of the North." One day was spent in the engineering establishment of Sharp Brothers, the eminent locomotive makers; the rest of the time was occupied in looking over the various textile manufactures in silk and cotton, for which this city is celebrated. Particularly were we delighted with the silk mill of Mr. Thomas Crompton, and the spinning establishment of Mr. Thomas Holdsworth; and we viewed with wonder and surprise, cotton yarn spun so fine that one pound of it would stretch two hundred and twenty-five miles.

By the kindness of the Earl of Ellesmere, a boat and men were placed at our disposal, for

the purpose of visiting the Bridgewater coal-pits at Worsley. After proceeding some miles along an underground canal, we descended a shaft and inspected the workings; then each boy, turning collier, obtained a specimen of coal for himself.

We proceeded to Liverpool and Birkenhead, and saw what was to be seen.

We spent five days in Birmingham, and were hospitably entertained during that period by a generous friend of science. We had an opportunity, in conjunction with the members of the British Association, then assembled in Birmingham, of visiting the caverns at Dudley, which, by the permission of Lord Ward, were splendidly illuminated.

We inspected the various manufactures of Birmingham; and after a week's tour, our pupils returned home with more sound practical knowledge of things as they exist than could be given in the schoolroom in twice twelve months.

In teaching chemistry our course is equally practical. Each substance is separately placed in the pupil's hands, until he understands its properties. Mixtures of various bodies are then given, and the pupil is required to detect and separate the different ingredients.

A practical knowledge of things is thus obtained, which, in conjunction with the practical information hereafter to be gained on the farm, in the mine, or in the arts, must inevitably prove of essential benefit to its possessor.

That the system of education which we advocate is a right and natural system, I have no doubt; and I hope to live to see the day when it shall be thoroughly carried out in every school in the kingdom.

I inclose you the reports of our various examiners; which clearly show, through independent parties, that by our system, we do, in addition, give an amount of *practical, scientific, and useful* information, which must be of essential benefit to our pupils in after-life.

I remain, dear Sir,

Yours very truly,

J. C. NESBIT.

CLOVER.

Clover, mown just as it is going to flower, loses about four-fifths of its weight in drying completely; that which is in a more advanced stage of growth and in full flower, loses but three-quarters, but the proportion is probably somewhat affected by the more or less humid state of the atmosphere during the time of growth. On the average we may reckon that, in the state of advancement which we have noticed as proper for mowing, 100 lbs. are reduced to 22 lbs.

The produce of clover is usually estimated in

dry fodder, because it is much more difficult to weigh it in the green state. There is much diversity of opinion respecting the medium produce of clover—estimates vary from 16 to 50 quintals per acre—and there is certainly an almost endless diversity, according to the nature of the soil and the cultivation bestowed upon it. A friend of mine weighed the quantity of fodder which he had obtained in two cuttings from an acre of clover, carefully measured, and on which the clover appeared to grow as thickly and strongly as I had ever seen. He weighed this fodder in a state of perfect dryness, and tied up in bundles, and found it to amount to 37 quintals 30 lbs. The soil was not peculiarly favourable to the growth of clover, but it was in a state of great fertility, and had been manured on the surface with ashes from the soap factory. I have therefore reckoned 40 quintals as the highest amount of produce that an acre of clover will yield in two cuttings. Since the time of which I am speaking, I have only once seen clover superior, or perhaps even equal, to the above; but, according to the descriptions which I have heard of that which grows in the most fertile regions, in Altenbourg, for example, samples are to be found which far surpass it. I have now before me a specimen of clover from that country, which, as I am assured by eye witnesses, has not been picked out as particularly fine, but rather taken as an average sample. It is, in flower, three feet high, and has twelve complete stems. The lower leaves are, in the dry state, four-fifths of an inch broad, and two inches long. I admit, then, that the produce of clover in dry fodder may far exceed 40 quintals per acre, but only under extraordinary circumstances.

In the first part of this work I mentioned 2400 lbs. per acre as the average produce of clover on a sandy clay, (good barley land,) provided, however, that the clover occupied an advantageous place in the rotation, and one in which the soil was in good condition. This appears to me to be the nearest approach to truth for land of this description.

In a well organized rural establishment, the necessary quantity of clover-seed should be obtained from the land itself, for the purchase of it would not only be very costly, but also attended with many inconveniences. It is certain, however, that the soil is impoverished by the reproduction of the seed; this effect is not very obvious, but any one who wishes to convince himself of it has only to grow clover-seed for two successive years on the same land. If he do not supply the loss thus occasioned by manuring, he will see his crops continue inferior for several years on the spot where the seed has been gathered. The impoverishing of the soil is not, however, so great as to preclude the possibility of its being richly repaid.

The seed is usually taken from the second crop; in this case the first crop is mown rather earlier than usual, in order that the second may shoot forth more quickly, and flower sooner. The first crop must not, however, be taken so early as to allow the backward shoots belonging to it to grow up after the first mowing, for they would then get the start of the second crop, and ripen too soon; as, however, an unfavourable state of the weather may sometimes prevent the setting of the clover, and cause it to flower without forming seed. It is advisable, for the sake of additional security, to obtain a portion of the necessary seed from the first shoot as its flowers are observed to set particularly well; the proper cutting of the seed may be judged by compressing the flowers between the fingers. They ought to be hard and resist compression. It is best to reserve for gathering seed a part of the field on which the clover is not thick, but uniform and free from weeds.

The ripening of the seed should be as complete as possible; some of the flowers get the start of the rest, and their seed falls to the ground in dry weather before the others have time to ripen; this inconvenience is experienced more with the first crop, when the weather is hot, than with the second. We ought never to pay so much regard to it as to mow the crop before the greater portion of the plants are ripe, for even if a portion be lost by waiting, the produce will, on the whole, be greater than it would be if the crop were taken before it was all ripe. We may know when the clover is ripe by pressing one of the heads between the hands till the moisture contained in it is completely exhausted; the husk may then be separated by blowing upon it, and the seeds will rest in the palm of the hand. If the seeds be of a violet color, they are ripe, but this is rarely the case with all of them. They should be hard and convex, presenting no depressions.

Seed clover should be mown in the dew, or at least not under a hot sun—it should be made into small cocks and left till quite dry. It dries much more quickly than young clover. Care should be taken not to shake it in carrying, and to place it where it will be well exposed to the air, if possible, on poles above the barn floor.

As soon as the clover is gathered in, especially if it has been housed in a state of perfect dryness, it is thrashed in order to separate the heads from the stalks on which they grow; this operation may, however, be deferred till the driest frost of winter. The husks, separated from the straw, are subjected to the flail, and the seed thus obtained from them is separated by means of a sieve; what remains on the sieve is passed through the fanner, that the empty husks may be carried away by the air, an operation which greatly facilitates the thrashing of the rest. This remaining portion is then taken

to the barn and spread out, for the sake of exposing it to the air, and drying it well; it is then thrashed again during dry weather, and the same process repeated. This series of operations may be repeated three or four times without effecting the entire separation of the grain. This separation is accomplished much more easily when the heads are dried by artificial heat. If the heat be too great, the seed loses its lustre, and assumes a brown tint. This color renders clover-seed very suspicious. The purchaser should look well to it. The safest method is to place a number of tables in a chamber which can be heated, and cover them with cloths on which the clover may be spread. The room is then to be heated strongly for some days, care being taken to guard against fire; when the quantity of clover-seed is sufficient to furnish a year's stock in advance, the best thing we can do is to defer the thrashing till the hottest days of the summer following. Such a provision is, in every respect, advantageous, inasmuch as clover-seed keeps perfectly well, especially before it is thrashed. The clover, in its husk, is removed from the barn floor, and placed on cloths spread out in the sunshine; it is then several times stirred with a rake, after which it is again carried to the barn floor and thrashed. This is the easiest mode of separating the seed.

When a large quantity of clover-seed is gathered, it may be separated in a mill suitable for the purpose, and adjusted in such a manner that it will not crush or break the seed. We may usually obtain 300 lbs. of clover-seed from an acre of ground, and therefore realize a considerable sum by the sale of it, especially when we keep the seed which has been obtained in a plentiful season, in order to sell at times when it is scarce, and consequently dear. To save the trouble of thrashing, many cultivators sow their clover in the husk; this method succeeds very well—the germination of the clover may indeed be retarded a little—but it will be rendered less precarious. But when clover is sown in this manner—we cannot guard against the seed being too thick in some places—and to ensure a sufficiency all over the field, it is necessary to sow twice as thickly as if the seed had been previously cleansed from its husk. The labor of thrashing is undoubtedly tedious, but it is incomparably more economical than the use of so great a quantity of seed, particularly if we have the means of preserving or disposing of the surplus. The straw and chaff of clover are not nearly so valuable as young clover hay; they may, however, be usefully employed in feeding cattle.

The observation, that clover does not succeed when repeatedly grown on the same spot, is too general to admit of its being called in question. False rumours and prejudices do, indeed, spread

in defiance of reason, but they do not, like this opinion, originate among the several nations at once—instances may, however, be found of clover having been sown for three or four times on the same land, and with uniform success. If now we examine the former cases with attention, we shall find that where the deterioration has been observed, the soil has been turned up to a small depth, only, as for example, in Norfolk, and in the duchies of Magelburg, Brunswick, &c. On the other hand, where clover has been found to succeed uniformly, it has been sown on gardens in the alternate system of four or five years, as in Belgium, for example. In these situations it is once ploughed to a considerable depth between two sowings of clover. In places where the land is manured with lime, marl or ashes, clover is not found to fail when often grown on the same spot. Gypsum, on the contrary, which is usually so beneficial to clover, is of no further use in those cases. I content myself with stating these facts without attempting to explain them.

It has been often and warmly disputed whether clover improves or exhausts the soil, and particularly whether it favours or injures the succeeding crop. Most persons incline to the former opinion, but it cannot be denied that many have experienced the truth of the latter. It has been positively ascertained that clover does not directly exhaust the land, for it is always observed that the success of the following crop is in proportion to the beauty and abundance of the clover, provided only that the latter has not been left to perfect and ripen its seed. The contrary would certainly happen if clover drew from the land a large portion of the nourishment by which it grows. But clover, when thin and weak, has a bad effect upon the soil, because it then permits the growth of weeds, particularly of dog's grass and other grasses, which have a disposition to spread; moreover the ground is hardened from losing the beneficial shade of the clover, particularly when the clover, in spite of its poorness, is left standing for a long time, and the land which has borne it is ploughed but once. If, then, we would obtain a good result from clover in this respect also, we omit nothing which tends to make it grow thickly and strongly. It must be sown on a rich, well cleansed soil, which has been lightened by fallowing or the cultivation of hoed crops; the sowing must be performed with great care, and the crop mowed at the proper time. The clover must then be ploughed up, when it has grown up a little after the second mowing, and long enough before the seed time, to allow the soil to settle itself, and the clover stubble to root; if, in spite of all the care bestowed upon the clover, it should grow but poorly, in consequence of unfavorable weather, and should be partly destroyed by winter, we must content ourselves with one

crop, and fallow the soil with three ploughings, succeeded by harrowing. When these rules are observed, the fertility of the soil will always be sensibly improved by the growth of clover, independently of the enrichment which it receives from the increased quantity of manure produced by the crop. Corn obtained after this plant is often finer than that which is grown upon a non-manured fallow.—*Thare's Agriculture.*

WHITE OR DUTCH CLOVER.—*Trifolium Repens.*—There are various kinds of clover which bear white flowers, even that of which we have been speaking sometimes changes color, but the name of white clover is almost always confined to the species of which we are about to treat. This species of clover is indigenous on almost all moist clayey soils; in our climate, it forms indeed part of the sward, and even if not perceived at first sight, it is soon discovered on closer inspection. It soon shows itself after the soil has been manured with substances congenial to its nature, such as lime or ashes, to such an extent indeed that some persons have imagined that its seed must be concealed in these substances.

Some cultivators also sow Dutch clover with the intention of mowing it, but it requires a very rich soil to cause it to grow to any considerable height. On a soil of this description it will sometimes yield a crop equal in thickness to that of common purple clover, and, according to some persons, preferable to the latter, as a fodder plant, of better flavor, yielding more nourishment, and above all, more conducive to the production of milk. But it yields only one crop, and does not rise much above the surface.

It is more frequently used to form pastures, and is certainly the most generally approved of all plants that are cultivated for this purpose. It is peculiarly fitted for a pasture plant by the disposition which it has to send forth shoots, and the quickness with which its leaves are reproduced, a quality in which it surpasses the purple clover. Again, Dutch clover is not so easily choked by weeds, but exterminates them by means of its roots, which thrust their way through the soil; hence it does not require a soil so well cleared, and may, with greater facility, be sown after repeated grain crops. It has also been remarked that Dutch clover is not, like purple clover, averse to growing frequently on the same soil, although that soil may have been but superficially ploughed, a consequence, no doubt, of the plant being indigenous, and growing spontaneously in this country. Some persons have, however, observed that on soils not very well adapted to its cultivation, it thrives better when first introduced than after the land has borne it for a number of years.

Purple clover is not found to be injured when sown alternately with white clover.—*Ibid.*

LUCERNE.

Mr. William Pepper, of Falcon Lodge, near Sutton Coldfield, in Warwickshire, cultivates lucerne, and he decidedly prefers the broadcast to the drill system; and he has very kindly furnished these particulars. He says that "a light dry soil should be chosen in the neighbourhood of the farmstead, and the deeper it is the better, as lucerne has a long root, which I have known to strike as deep as 6 feet. The ground should be quite free of weeds, and well covered with good fold-yard manure, which should either be dug down 18 inches deep, with a double spit of the spade, or ploughed down with a double furrow, by one plough following another. The best time of sowing the seed is about the middle of March, when it should be sown *broadcast* at the rate of 20 lbs. per acre, at a cost of 1s. 8d. per lb. It may be harrowed with barley, upon land that has carried turnips, as being then in the cleanest state; but it may be sown after grass or stubble, provided the land has been properly laboured and cleaned."

I may relate here Mr. Pepper's entire culture of this plant. "Towards the latter end of October, or beginning of November;" continues Mr. Pepper, "the lucerne should be covered with light stable manure to preserve it from the frosts during the winter; and towards the beginning of March, in the ensuing season, it should be harrowed with light grass-seed harrows, to remove the few remaining weeds, and rolled. After it has been mown in May for the first time, it would be advisable to scatter over it again a light dressing of manure, in order to encourage the growth of the second crop. When the ground is cleared in the end of the season, it will be necessary to apply harrows upon it of a heavier description than those employed in the season before, as early in the season as the crop will admit; and continue to harrow until the ground is free of all weeds, and almost like a fallow, as the lucerne roots will now have got so deep as not to be injured by harrowing; and then immediately covered with manure, it will be found free of weeds in spring."

This mode of cultivating this useful plant will produce eight tons of forage per acre: but it should be borne in mind that, when so much is taken from the ground much manure will require to be given in return. The broadcast plan is very much preferable to drilling. I have known many sow it in drills, and, after a few years, give it up, in consequence of the great trouble and expence incurred in hoeing and cleaning; but the broadcast system saves all the trouble.

I sowed my lucerne in 1830, and have continued mowing and manuring it every year since; and in some seasons I have got as much

as 12 tons per acre. It is a hardy plant, and will endure cold if cultivated in dry soil; but it flourishes best in a hot summer, when I have seen it run to the height of 5 feet 5 inches, though its usual stature is about 4 feet; and when all the other grasses were burnt up, it has remained green and succulent. It is particularly calculated for horses, though pigs will greedily consume the refuse that comes from the stable, and thrive well upon it; but it is too strong in the stalk for cows, and by no means so good for them as tares. If cultivated upon proper soil, an acre will keep three strong cart-horses for 6 months, from 1st May to October; and after the first year may be mowed twice or thrice, according to the season.—*H. Stephens' Book of the Farm.*

QUANTITY OF LIME USUALLY APPLIED TO LAND.

The quantity of quick lime laid on at a single dressing, and the frequency with which it may be repeated, depends upon the kind of land, upon the depth of the soil, upon the quantity and kind of vegetable matter which the soil contains, and upon the species of culture to which it is subjected. If the land be wet, or badly drained, a larger application is necessary to produce the same effect, and it must be more frequently repeated; but when the soil is thin, a smaller addition will thoroughly impregnate the whole, than where the plough usually descends to the depth of eight or ten inches. On old pasture lands, where the tender grasses live in two or three inches of soil only, a feeble dressing more frequently repeated appears to be the more reasonable practice, though in reclaiming and in laying down the land to grass, a heavy first lining is often indispensable.

In arable culture larger and less frequent doses are admissible, both because the soil through which the roots penetrate must necessarily be deeper, and because the tendency to sink beyond the reach of the roots is generally counteracted by the frequent turning up of the earth by the plough. Where vegetable matter abounds, much lime may be usefully added, and on stiff clay lands after draining, its good effects are very remarkable. On light land, chiefly because there is neither moisture nor vegetable matter present in sufficient quantity, very large applications of lime are not so useful, and it is generally preferable to add it to such land in the state of compost only.

The largest doses, however, which are applied in practice, alter in a very material degree the chemical composition of the soil. The best soils generally contain a natural portion of lime, not fixed in quantity, yet scarcely ever wholly wanting; but an ordinary liming, when well mixed up with a deep soil, will rarely amount

to one per cent. of its entire weight. It requires about 400 bushels (12 to 15 tons) of burned lime per acre to add one per cent. of lime to a soil of twelve inches in depth. If only mixed to a depth of six inches, this quantity would add about two per cent. to the soil.

Though the form in which lime is applied, the dose laid on, and the interval between the doses varies, yet in Great Britain, at least in those places where lime can be obtained at a reasonable rate, the quantity applied amounts to, on an average, from 7 to 10 bushels a year.

The most remarkable visible alterations produced by lime are—upon *pastures*, a greater fineness, sweetness, closeness, and nutritive character of the grasses; on *arable lands*, the improvement in the texture and mellowness of stiff clays, the more productive crops, their better quality, and the earlier period at which they ripen, compared with those grown upon soils to which no lime has ever been added.

But those effects gradually diminish, year by year, till the land returns again nearly to its original condition; on analysing the soil when it has reached this state, the lime which has been added is found to be in a great measure gone. In this condition, the land must either be limed again, or must be left to produce sickly and unremunerating crops.

This removal of the lime arises from several causes:—

1. *The lime naturally sinks* more slowly, perhaps, in arable than in pasture or meadow lands, because the plough is continually bringing it to the surface again, but even in arable land, it gets at last beyond the reach of the plough, so that either a new dose must be added to the upper soil, or a deeper ploughing must bring it again to the surface.

2. *The crops carry away a portion of lime from the soil.*—Thus the following crops, including grain and straw, or tops and bulbs, carry off respectively:—

	OF LIME.
25 bushels wheat, about	13 lbs.
40 “ barley, “	17 “
50 “ oats, “	22 “
20 tons turnips, “	118 “
8 “ potatoes, “	40 “
2 “ red clover “	77 “
2 “ rye grass “	30 “

The above quantities are not constant, and much of the lime is, no doubt, returned to the land in the straws, the tops and the manure; yet still the land cannot fail to suffer a certain annual loss of lime from this cause.—*Johnston's Agricultural Chemistry.*

POSITIVE PENURY.—To abound in all things, and not to know the right use of them, is positive penury.

SCHLESWIG AND HOLSTEIN DAIRY MANAGEMENT.

The pride and boast of the Holsteiner is his dairy; and as Holstein butter may well claim to be the best in the world, the following sketch of the management by which the dairy in that country is more especially distinguished, may not prove uninteresting nor useless to the English farmer.

A dairy consisting of 200 cows, gives employment to the following number of persons:—a dairy-man, a dairy-maid, a cook, a cooper, two cow-herds, an odd man, a cheese-maid, and ten dairy girls. The dairy man's duty involves a general charge of the cattle, the calves, and the swine; he is responsible for their being regularly and suitably fed; that the cow-herds do their duty; that hours of milking, &c., are punctually adhered to; and that everything and every person is in proper place and keeping. He must pay strict attention that the cows are milked thoroughly out, on which so much depends. The dairy-maid has the superintendence of every work which belongs to the treatment of milk, butter, and cheese, from the moment that the milk is brought to the dairy room, and is answerable for the cleanliness of the whole dairy house; she is also housekeeper, and orders the extra work for the girls not included in the dairy, as gardening in summer, and spinning in winter. Her own particular work in the dairy is to skim the milk, to manage the process of converting the cream into butter, to beat the butter as will be afterwards described, to superintend the cheese making, to put in the proper quantity of rennet and salt, and to look after the cleanliness of the dairy utensils. The cheese-maid attends to the manipulation of cheese making, and has to measure the fresh milk as it is put into the tubs, to clean out the dairy room, and to rub and turn the cheese.

The 10 dairy girls have each to milk from 16 to 18 cows, to do all the work in cleaning the dairy utensils and the dairy house, and either to spin or work in the garden, and any other work which is ordered by the dairy-maid. The cooper repairs and renews the dairy utensils, and makes the casks to contain the butter for sale; he assists at the milking, and takes the duties of the dairy-man in case of his illness, as far as the care of the cows and pigs. The odd man milks his number of cows, feeds the pigs, and carries the skim milk out of the dairy room into the cheese tub. When the cows are in the stables, these two last persons assist the dairy-man, with the help of the cow-herds, to give the hay and corn to the cows. One cow-herd is kept for each 100 cows, their duty being to watch the cows as long as they are in pasture, and to collect them together at the milking times. In the winter, when the cows are housed, they have to give them straw and water,

and to make up the beds four times a day, so that the cows always have clean straw to lie down upon. The dung is removed by a man whose time is fully occupied by that particular duty.

The routine of dairy work is regulated to follow in 12 hours, to leave exactly the space of time between each operation with the milk, cream and butter. The morning work commences in summer at two o'clock, by the establishment being called by the girl whose duty for the week has been to remain up the night, preparing the hot water required for the first operations. On entering the dairy-room, the dairy-maid, with the assistance of the cheese-maid and two of the handiest of the girls, skims the milk, which has stood in the tubs 36 hours; it is carried by the odd man into the cheese tub; the milk tubs, as they are emptied, are washed and cleaned in the following manner. The tubs, made of oak wood, painted red inside, are placed upon the floor of the ante-cellar, and the girls are divided into two parties, so that two tubs at a time are undergoing the same process of cleaning. The first girl puts a ladle of boiling water into each of two tubs; next, girls follow with small birch scrubbers, to remove the particles of adhering cream or milk, which is emptied into a pail for the pigs; the fourth and fifth girls, with boiling water and a hard round brush made of pigs' bristles, with which every hair's breadth is thoroughly scrubbed and polished, to remove all acidity. The sixth and seventh girls wash the outsides and bottoms of the tubs well with cold water. The eighth girl gives them the final washing in a cold bath, and places them on a heap, when they are examined by the dairy-maid, and put out in the air to dry. During the time the dairy-maid is examining the tubs, the cheese-maid washes the floor in the milk cellar upon which the tubs stand. As soon as the girls have finished the cleaning of the tubs, they carry the skimmed milk which has been heated into the cheese tub, to give the proper temperature to the whole before the dairy-maid adds the rennet and colouring. These preliminary operations being ended, the dairy girls dress, and having partaken of a piece of bread and butter, at four o'clock proceed with the men to milk the cows. The dairy-maid now commences the churning operations, which must be accomplished in not less than 50 or more than 60 minutes, by the power of either steam or horses.

While the churn is in motion, she has time to beat the butter made the previous day, and to put it into casks, all attention being paid that no interstice shall remain either between the layers of butter or the sides of the casks. The cheese-maid is now occupied in cheese-making. At half-past six, the milkers have finished milking, the milk is conveyed in pails swung upon

bars stretched across a waggon, to the dairy house, and carried into the cellar by the girls, where it is immediately strained through a hair sieve into the tubs, each containing a measured quantity; this duty is performed by the cheese-maid, who must have finished, with the assistance of the cook, cheese making, on the return of the milkers.

The girls then carry the tubs placed out to air into the cellar, where they remain twelve hours. After breakfast they wash out the milk pails and the conveyance pails, the churns, &c., and all other utensils that have been used that morning, and wash out the ante-cellar, and then they dress. At nine o'clock they do any work unconnected with the dairy until eleven o'clock, when they are called to dinner; at 12 o'clock they lie down to repose until 2 o'clock, when the routine of work is repeated as above described, and completed at 7 o'clock, when they sup, and dispose of their time until 9 o'clock, at which hour they retire to bed.

The dairy maid is by far the most important person in the establishment, as on her skill, attention, and diligence, depend, in a great measure, both the quantity and quality of the butter, and by consequence, the profit of the produce. She must not only thoroughly understand, but accurately observe the moment when the cream has attained the proper degree of acidity in the cream tub, also regard the temperature, adding either hot or cold water in the churning. The cream, when skimmed, is put into a large tub, where it generally remains 24 hours, or until it has reached the first stage of fermentation before it is churned. When the butter "is come," it is placed in a trough and washed over with water as cold as possible, to separate the milk from the butter; the water is drawn off, and the butter is beaten so much that the milk is almost entirely pressed out; salt is then sprinkled upon it, and the mass loosely turned over, to give the salt time to extract any remaining particles of milk or moisture.

After remaining 12 hours, the butter is again beaten, to squeeze out the brine, and after remaining 12 hours longer, it is again beaten and placed in the casks.

Although it is an ascertained and undeniable fact that the quality of butter depends much upon the nature of the pasture, yet, to the untiring attention and experienced skill of the Holstein dairy farmer must in a great measure be ascribed the great reputation which his butter has of late years held in the London market, to which the greater part finds its way.

The qualities of first-rate butter are considered to be, first, a fine even yellow colour, neither pale nor orange tinted; second, a close waxy texture; third, a fresh fragrant perfume and a sweet kernelly taste; and fourth, good butter will, above all, be distinguished by keeping for

a considerable time without acquiring a rancid flavour.—*R. S. Graham, Bultigh, Nov. 12.—Gard. Chronicle.*

PESTS OF THE FARM.

THE WIRE WORM.

The wireworms usually eat into the stalk just about the root, and sometimes separate it from the root altogether; they seldom, however, remain so long engaged upon the one spot or portion of stalk. When they attack potatoes, they penetrate into their very hearts, and thus frequently wholly destroy the sets when newly planted; to obviate which it has been recommended to plant whole potatoes.

Amongst the green crops, turnips may be regarded as the greatest sufferers, and the tender young plants are, of course, most victimized in autumn. Multitudes of these ravenous grubs may then be found gnawing at the roots of the young turnips, and even biting off their extremities. They also frequently attack the stalk, bite it across, and when the stems fall, attack the leaves. This is, however, one of the least formidable of the robberies of this persevering pest, and if the wireworms were satisfied with the leaves alone, they would not be so injurious. In gardens, lettuces are the principal victims, but the annual flower-plants also suffer greatly—pinks and carnations are gnawed across their stems, and rendered lifeless. I will now offer some suggestions for the extirpation of this very rapacious insect.

It is, as I have already had occasion to observe, most necessary that we should possess some acquaintance with the *natural history* of such animals as we desire to destroy. Such knowledge facilitates our operations, by informing us of their haunts and habits, of their dispositions and predilections, and, consequently, not only of *where* we are to seek for the pests, but of *how* we can best set to work to accomplish their destruction. Recollect, I may remark, in passing, that the BEETLES, whence the wireworms are produced, are, although not necessarily mischievous themselves, to be regarded as the grand source of your annoyances. Let it be your care, therefore, to have these caught and destroyed; they will be chiefly found, during spring and summer, upon nettles, hemlock, fools' parsley, and other such herbs. Let this be *one* of your cares.

Still, however active you may be in destroying the beetles, you will find that you have succeeded only in *diminishing* the number of this pest; you cannot hope to extirpate them; but is it not some consolation, even to have succeeded in effecting a *diminution* of their numbers?

The eggs are chiefly desposited in pastures where the surface has been undisturbed, and in clover layers and fallows. Where, therefore, they make their appearance, you will find it a good plan to have your pasture eaten close by sheep. *Rolling*, in early spring, is also recommended, and is, in my opinion, very likely to prove serviceable, having been preceded by a top-dressing of lime. I recommend a top-dressing of lime, salt and soot. Such farmers as I have prevailed upon to try the experiment in this country (Ireland), have found it very efficacious. The proportions I recommend are as follows:—

Lime	...	...	...	2 parts.
Soot	...	...	...	3 parts.
Salt	...	...	...	1 part.

The salt may be purchased from salt works, or extensive dealers in that article, as *spoiled* salt—there being accidents which will render it unfit for market as salt, without at all militating against its value as manure, or a top-dressing. The lime should be quick-lime pounded, and the mixture should be applied to the land as speedily as possible after having been compounded: be it also remembered that this composition will be found a valuable fertilizer, as well as a foe to insects of all sorts. Woad, sweet gale, the refuse of gas-works, spirits of tar, chloride of lime, nitrate of soda, mixed with the manure, will be found very serviceable; at all events, effecting a sensible diminution in the numbers of the wireworm, and of course a diminution of their ravages in an equal ratio.

It has been tried to destroy the wireworm by *flooding*, but this is only a useless attempt, it being almost impossible to drown this creature, which will be found as lively as ever after total immersion for three, or even four, days; still, however, such flooding, though it will not destroy the worms, interferes with the *laying* of the beetles which produce them, and will consequently, in this point of view, be occasionally found useful.

The following, being an extract from a letter from an agricultural friend, was read by Mr. Palmer, M.P., at a meeting of the "Faringdon Agricultural Society," in the beginning of the spring of 1846:—"The way I use soda is, to sow it broadcast; I have never found it fail. The chemist, your friend, must have been ignorant that good soda-ash contains fifty per cent. of free alkali. The last year I had a failure of beet carrots, which I attributed at the time to the season, but upon examining the soil carefully, I found WIREWORMS. As it was to be wheat this year, and my last sown wheat, I mixed it with soda-ash. It is now growing faster than any wheat upon my farm, and not a blade missed. Until I

adopted the use of *soda-ash*, I suffered sometimes to the amount of **SIXTY IN A FIELD!** The discovery was accidental; I had sown a headland with it as a fertilizer, on the principle laid down by Sir Humphrey Davy, that all alkalis were stimulants to plants; it certainly improved the crop, but upon the whole, I considered it a failure. The following spring it was *turnips*, and a man hoeing asked me, "If anything had been done to the *headland*?"

I asked him "Why?" He said, "*There was not a plant destroyed by wireworms, and the rest of the field had fifteen to a nest!*" I then determined to try it upon another field which was full of wireworms; *I have never since seen one in it.* In the following year, I had twenty-five acres of oats attacked more generally; I happened to have a cask by me, and ordered it to be sown. From that day the ravages ceased, and within a week the whole field had changed its color to a vivid green. I have since ceased to consider it as an experiment, and have always a cask by me ready, in case of any appearance of the *wire-worm*, and have not a patch as large as my hand suffering from wireworm on my farm." This is no vain boast; I have known *soda* tried by practical men, who were most unwilling, unless actually coerced into it, to listen to any novelty, and they have unanimously asserted the success of their experiments with *soda*. It is equally efficacious in repelling the attacks of the *green-fly*, which, from its ravages and the difficulty that has been experienced hitherto in getting rid of it, might, though the insects are of different species, very fairly be entitled the twin-brother of the *wire-worm*.

In gardens, that most certain of remedies, *hand-picking*, may be resorted to. Lettuces are, as I have stated, among the most frequent sufferers; let, therefore, the earth be gently scraped away from about the roots of such as are affected, the worms removed, and the earth then as gently returned. *Hand-picking* may also be resorted to in the case of young *turnips*, and in such fields as are bordered by a marsh; for it is in the immediate vicinity of the marsh that these worms will be found to congregate in the greatest numbers. In gardens, the *wire-worm* may also be attacked, and destroyed by means of poison and traps; the former will answer for the worm, and the latter for his parent, the beetle, or elater. For poison—slice potato stalk, or turnip, or parsnip, or carrot, or even marigold, or beet-root—take a feather, and dip it in a solution of corrosive sublimate, dissolved in alcohol, or spirits, then lightly touch the bait with the feather, and having allowed the spirit to escape by evaporation, stick the bait into the loose soil, near such

plants as had previously indicated the presence of the worm. This remedy is of course peculiarly suited to *gardens*, but it may nevertheless be adopted by the farmer with some success. Birds also consume immense quantities of these worms; as also do frogs, toads, and those beautiful little creatures resembling the lizard in form, but differing from that class of animal in being furnished with gills, like a tadpole, during the earlier stages of its existence. I allude to the *Water Eft*, or *Newt*, which, at certain seasons, leaves the water, and, emerging upon the land, makes great havoc among many of our insect pests.

This reminds me that the frog is often unjustly persecuted by gardeners, under the idea that it eats or spoils their *strawberries*. Nothing can be more erroneous. I, myself, conceiving it allowable to sacrifice one or two lives in order to save many thousands, killed and opened several frogs, and did not find any portion of *strawberry* in their stomachs, but invariably *numbers* of insects. I have spoken to many intelligent gardeners on this subject, and have found my opinions confirmed. Let frogs and toads, therefore, be encouraged in your lands—recollect that the fabled character of the toad is only a tissue of nonsense; that the animal's entire food consists of *insects*, of such creatures as you are most anxious to destroy. Call them in, therefore, to your assistance—protect them, regard them as your friends and fellow laborers, and they will aid you most extensively. The robin, blackbird, wag-tail, thrush, together with poultry, and rooks, &c., feed on these insects; but it is for you to consider whether these birds are likely, by their destruction of insects, to compensate for the damage they themselves personally do to your crops.

PLOUGHING DECLIVITIES.

The first consideration to be taken into account when land has thus to be laid out in ridges, is the direction of the inclination most likely to facilitate the drainage of moisture from the furrow, and such a one should be adopted, unless there are good reasons for preferring some others. But where this point is quite immaterial, the ridges should be traced from north to south, in order that grain on each side of them may enjoy nearly equal advantages from the influence of the sun's rays; otherwise the vegetation of those parts, inclining towards the north, will be much more backward than that on those which face the south. Were it not for this, it would be better to plough from east to west, because the soil then receives the rays of the sun more vertically, so long as it remains in the state in which it was left by the plough, and profits more by their influence.

On fields situated on mountains, hills or declivities of any kind, the ridges are usually arranged in a very injudicious manner, viz: in the same direction with the declivity of the soil. Such is, at all events, the case in places where the land is very much divided, and the property intermingled, probably because when the division was first made, nobody had been found who would take the superior or upper part for his portion, all the fertilising juices and particles of which are washed downward, or would resign his share of the lower parts, which possess so many decided advantages.

This injudicious arrangement of the ridges is attended with many inconveniences. When heavy rains fall, the vegetable is easily washed away by them and it not unfrequently happens that on the top of the declivity large hollows are to be found, from which the earth has been washed down to the bottom where it forms high embankments, when only light showers fall the water runs too rapidly from the upper part of the field which is often suffering from drought, while the lower portions have a plentiful supply of moisture; the cattle employed in ploughing are dreadfully exhausted by the up hill work those which are naturally indolent and disinclined to exertion require very severe treatment to make them get through their work, while others that are active and full of spirit become heated and tired, thus rendered liable to take disease. Nothing, therefore, but a minute parcelling out of the land can justify such an arrangement of the ridges.

The most advantageous disposition of them that can be made on an inclined surface, is to give them a horizontal, or slanting direction; the former is preferable on gentle declivities: the latter on abrupt inclinations. By this means moisture is retained longer in the trenches on heights exposed to drought, and more humidity is communicated to the superior ridges. Even on rapid declivities the water flows slowly in those furrows, the obliquity of which diminishes their inclination. When heavy rains fall they do not wash the earth from the bottom of the furrows, and if the showers come but seldom, the land does not suffer so much from dryness. It has sometimes happened that the mere act of changing the direction of the ridges has tended considerably towards the amelioration of property situated on hilly places, increased the amount of produce obtained from it and rendered the crop less casual.

The arrangement just mentioned is also calculated to lessen the labor of the draught cattle, although it cannot be denied that it increases that of the laborer. When fields situated on a declivity are ploughed by a common plough having an immovable ear which turns the slice alternately upward and downward, it is very difficult to produce a proper revision of the furrow

slice when turned from the lower side, because, in that case, it has to describe a larger segment of a circle before it arrives at that point from which its own weight will cause it to fall over. It not unfrequently happens that it falls back into the furrow. The ploughman is therefore compelled to exert all his strength to keep the plough inclined towards the right, and is frequently obliged to turn over the slice with his foot unless he is followed by some person whose express duty it is to turn over the slice with his foot, his hand, or with a fork. The best thing which can be made use of in such cases, is that elongation of the mould board described by Schwertz in his, "Agriculture of Belgium."

On rapid declivities it is almost impossible to turn the slice over from below upward. There the only thing to be done is always to turn the slice towards the bottom until the whole field is transformed into a series of terraces, each one lower than the other. This cannot be effected with a common plough having an immovable mould-board, except by managing it so that it shall always be engaged in the soil on one side and shall turn the slice over on the one that immediately preceded it, a mode of proceeding which occupies a great deal of time and fatigues the cattle very unnecessarily, causing them to pass over every inch of ground twice. It is far better to make use of a plough having a movable mould board which can be turned either to the right or to the left, as seems requisite; instruments of the description just mentioned are invariably used in all places where they are known. The Mecklenberg binoir is very useful in these circumstances; indeed in many cases it is superior to the plough, because it does not throw the earth so low as that instrument. It will easily be conceived that by degrees the plough will amass all the good soil at the foot of declivity while the top will become barren. Judicious agriculturists remedy this evil by applying all their manure to the upper part of the field, or at any rate distributing it in such a manner that that part shall always receive the greatest proportion, but this renders the carriage of the manure a much more laborious operation.

When the rapid declivities are ploughed in a slanting or inclined direction, it is of the utmost importance that such an inclination should be given to the ridges as will prevent the plough from having to encounter any sudden or abrupt declivities. Nothing but mere general rules can be laid down for guidance on this point; the first thing a farmer should do before laying out the ridges, is to traverse his land in all directions, and ask himself in different places how the slices can best be turned over. In some places he will find it necessary to plough outward, in others to plough inward, and in others again to turn the slice over on the same side.

The facility with which the work will be performed, as well as the goodness of it, will depend essentially upon the accuracy of the ploughman's eye, and his skill and experience in operations of this nature. The binoir will in general be found to be preferable to the plough on hilly fields, because in turning over the soil it enables the laborer to exercise his will and judgment with greater freedom.

It is a beautiful sight to see the order and regularity with which rapid declivities can be ploughed by skilful men who are accustomed to the use of this instrument. By means of the arrangement of which we have been speaking and by giving an oblique direction to the furrows the water may be made to drain away so gradually as not to carry any portion of earth with it nor yet deepen the furrows through which it passes.—*Thaer's Principles of Agriculture.*

THE FIELD BEET.—This plant also called *mangold wurzel*, and sometimes *root of scarcity*, (*mangel wuizel*) is with all its varieties, either a descendant of the *beta vulgares* alone, or the result of the mixture of this plant with the *beta cucla*; I regard the difference pointed out by the botanists between these two plants as too insignificant, and as far as my observations goes, too vague to serve as the foundation of an absolute distinction. It appears to me that the crossing of the deep red colored garden beet and the white beet has given rise to all the existing varieties of this plant, some approaching to the former and others to the latter species: and that from these again new varieties are continually produced, among which we now and then meet with individuals belonging to one or other of the original species. It is therefore impossible to distinguish precisely between the various kinds of beet any more than between the several kinds of other cultivated plants, the varieties of which pass one into the other by insensible gradations.

The two kinds of beet which occupy the extremities of the series are the deep red beet, which has long been cultivated in our kitchen gardens and that which is perfectly white, between these are the large scarlet beet: the flesh colored beet which is sometimes marked with rings of that color; the variety which is red without and perfectly white within: the yellow beet, and that whose color is a mixture of yellow and white. The color of the root commonly resembles that of the leaves or rather of their edges, which are either quite green or tinged with red. Even seed taken exclusively from one plant always produces several different varieties. The unmixed red and white are however the most constant. The pale red beet is the largest and most

productive of all, and is therefore usually cultivated as food for cattle. There are two varieties of this, one whose root buries itself under ground and another which shows a disposition to rise above the surface. My own observations lead me to consider these dispositions as essential to the varieties in question, but the nature of the soil has also considerable influence upon them. I once divided with a friend a quantity of seed which had been given to me as belonging to the variety which rises above ground. My land was ploughed to the depth of ten inches, and his to a small depth only.

On a soil of small depth the variety which grows above ground is certainly to be preferred, as on such a soil it produces a heavier crop than the other, but on a deep soil the underground variety is preferable if only from being less exposed to injury from frost in autumn. The yellow and white beets on the other hand, have the advantage of possessing greater consistence, and resisting cold rather better: but for Agricultural purposes these qualities do not compensate the greater volume obtained from the reddish varieties. But, grows on all soils which contain a moderate quantity of moisture and a large proportion of nutritive matter, but on sandy soil its size is small, unless indeed, a large quantity of rain fall during the period of its growth. On a light soil rich in humus and moist by situation it becomes watery and very thick, but hollow in the middle and difficult to preserve from rotting quickly. The soil best adapted for beet is an argillaceous soil possessing moderate tenacity. On land of this description it always succeeds, and acquires more consistence than on any other kind of soil. I therefore make it a rule in the cultivation of weeded crops to sow the greatest quantity of beet on tenacious soil, and of swedish turnips on those which are sandy.

To produce beet of a large size, the soil must be well manured, but it matters not whether the manuring has been performed expressly for the beet or for a preceding crop, provided that in the latter case, the soil still remains in good condition. Fresh manure should be mixed with the vegetable soil by two ploughings at the least.

The deeper the soil the better it is adapted for the growth of beet: to obtain a good crop of this vegetable on a soil of small depth it is better to sow or plant it on beds or ridges.

The seed may be then sown on the spot where the plant is to grow, the individual grains may be placed in separate holes, or the seed may be drilled at least twice as thickly as the plants are to remain, but this latter method is practicable only on a warm light soil which is tolerably free from weeds, for the germ has some difficulty in opening the hard skin in which it

is enclosed. It is a considerable time before the young plants display their seminal roots and by that time the field is covered with weeds of considerable height. The germination is often interrupted either because the seed is too near the surface, and cannot find a proper supply of moisture, or because it is too deep in the ground and development becomes impossible. On ordinary soils transplantation is usually the preferable plan, as it leaves time for giving the requisite preparation to the soil. But as the vegetation of the plant is disturbed by transplantation, it is important to procure the seedlings in good time, and therefore to sow as early as possible.

The method which is found to be most advantageous consists in advancing the germination a few days before sowing by moistening the seed with water from the dunghill and then setting it in rows, two or three grains at a time along a cord on which equal distances are marked. The seed is placed in little holes about an inch or an inch and a half in depth, and formed with a dibbler; it is covered with mould, taken from the preceding hollow, or if the soil be very light the earth is pushed over the seed, by the foot of the sower as he advances. When this plan is pursued, germination takes place quickly, and the weeds do not get the start of the beet plants. Care must be taken to uproot the superfluous plants as soon as those which are to remain have put forth three or four leaves.

The plants require careful cultivation during their growth; it is upon this indeed that their success mainly depends. The cultivation is performed with the horse-hoe but in spite of the opinion of some agriculturists, a slight earthing up is very useful even to the variety which grows chiefly above ground. The large fleshy leaves of the plant attain their greatest size in August; many cultivators set great value on the green fodder, furnished by these leaves. According to approximate calculations, if the leaves be stripped early and frequently the produce which they afford is greater than that of the roots but it is obtained at the expense of the latter, for if the leaves be stripped early and to excess, the roots remain very poor. Cattle eat these leaves but are not very fond of them, and though large they appear to contain but a small quantity of nutriment. Whatever is gained in real value on the leaves is lost upon the roots. Moreover the gathering of the leaves is troublesome, and on the whole I think that nothing but a scarcity of other kinds of fodder can justify this operation in an economical point of view. It is only in autumn when the plants have attained their full growth and the crop is soon to be taken off that the leaves can be properly cut close to the root and given to the cattle.

The roots are easily pulled up, but the removal of the filaments, which is necessary to the preservation of the roots, is not so easy. But roots grown in an argillaceous soil have not so many of these filaments.

It is difficult to preserve the roots to an advanced period of the winter, for they are very sensible of cold, and soon destroyed by it; in warm cellars they are very liable to rot, so that they require to be placed in beds and separated by straw or sand,

Beets possess the advantage of being almost exempt from the attacks of insects.—*Ibid.*

MR. FLEMING'S PEAT COMPOST.—Many ways of working up peat (moss) have been suggested, such as adding lime, salt, and other substances, to aid fermentation. The most successful of these substances with which I am acquainted is one which has been used with much advantage on the home farm of Mr. Fleming, of Barochan. This compost consists of—

Saw dust or moss earth,	40 bushels.
Coal tar,	20 gallons.
Bone dust,	7 bushels.
Sulphate of soda,	1 cwt.
Sulphate of magnesia,	1½ "
Common salt,	1½ "
Quick lime,	20 bushels.

These materials are mixed up together and put into a heap, and allowed to heat and ferment when the compost is ready for use. Compared with farm yard manure and guano, this mixture gave on hay and turnips:

1. On hay, per imperial acre—

	PRODUCE.	COST.
Nothing,	416 tons.	
Guano, 3 cwt.,	752 "	£1 10 0
Compost, 40 bushels,	761 "	1 0 0

2. On turnips, Jones' yellow top—

	PRODUCE.	COST.
Farm yard manure, 28 yards, 26 tons,		
Guano, 5 cwt.,	18 "	£2 10 0
Compost, 64 bushels,	29 "	1 11 0

According to these results, this compost is superior even to guano. The experiments, however, require repetition, and the results will, no doubt, vary with the kind of soil and crop to which the compost is applied.

NOTICE.

THE GENERAL MEETING of the LOWER CANADA AGRICULTURAL SOCIETY will take place at their Rooms, in this city, on FRIDAY, the 15th of MARCH, instant, at 11 o'clock, A. M., for the purpose of electing Directors for the ensuing year.

By order,

WM. EVANS,
Secretary L. C. A. S.

Montreal, 1st March, 1850.

Agricultural Journal

AND

TRANSACTIONS

OF THE

LOWER CANADA AGRICULTURAL SOCIETY.

MONTREAL, MARCH, 1850.

"Knowledge is power," we are constantly told, and we believe it, but for agriculturists there is some instruction more necessary than what is understood by those who assert that knowledge is power. The knowledge taught in schools may be power so far as it goes, but it will not give the power that would be most useful to enable a farmer to cultivate and manage his farm in the best manner and to the greatest advantage. Useful knowledge is what agriculturists require, and this should include all the knowledge that would be necessary to make a farmer complete master of his profession, as well as fit him for acting in any capacity or situation which the Government or the country might call upon him to fill. This is the education that would be power to the farmer, and the education to which he is entitled when taxed to pay for it. What, we would beg to submit, would be the value to this country of a dozen young men coming from school, well educated, and also practically instructed in the science and art of agriculture, settling in the country upon farms, to be an example to all around them, compared with a dozen young men educated for what are termed, the "Learned Professions," on leaving school, and settling in cities, towns or villages, as doctors, advocates, notaries or politicians? We shall not reply to this question, but leave it for the consideration of others. If knowledge gives power, the agricultural class are entitled to have that sort of knowledge that will give them power to act for the most advantage for themselves and for the whole community. The education fitting for a merchant, a doctor or an advocate, is

not all that is necessary for a farmer, or at least is not, alone, the most suitable for him. We cannot expect, under present circumstances, that our youth would be able to obtain at school all the instruction necessary to make them good farmers, because we have not at present school masters capable of imparting this instruction, nor model-farms where they could see the practical work of agriculture in operation. It is in our power, however, to introduce in all country schools suitable books on the science and practice of agriculture, for the reading of the sons of farmers, and thus lead them to think of the profession they are to be engaged in for life. The great objection to the present system is, that the whole tendency of the education of the children of the rural population is to fit them for any business rather than farming. Examine their school books, and all the stories that are to be found in these books, of persons who have gained renown, wealth or respectability, refer to every business and profession but that of agriculture. This reading induces the youthful mind to prefer that business or profession where there is a chance of gaining wealth and a higher station than he conceives it would be possible for him to arrive at on his father's farm. He never reads of any farmer becoming a renowned general, admiral or statesman, or of gaining such great wealth as merchants or manufacturers, or such high station as professional men often attain to. All these are tempting objects to strive for, and he therefore despises the profession of a farmer, that does not offer him the same chances in the race of life. Farmers, or those engaged in husbandry, seldom become book-makers, and this is one cause, that so little is found in school-books in commendation of agricultural pursuits, or having any reference to husbandry. It is a strange inconsistency that this should be the case, considering that agriculture is the first and most useful profession on earth, and actually necessary to man's existence. While this system continues, farmers have no fair chance of suc-

ceeding to perfection in their business, and there is not yet any symptom of a disposition to provide a more suitable and useful education for the rural population. We can have no object in bringing this subject so often before our readers, but that we conceive it to be of such vital importance, not only to agriculturists but to the Canadian community of all classes, that we would not be doing our duty faithfully, were we to neglect to do this, until some action is taken in the matter. There is no useful purpose to be attained by allowing ourselves to be persuaded that the general agriculture of Lower Canada is in a state of progressive improvement, because there is no doubt that it is not so. There are improvements introduced in many instances undoubtedly, but not to the extent required to secure that degree of general prosperity, which the country is capable of attaining to. We cannot perform a greater service to our country than by endeavouring to understand what impediments exist to its prosperous condition, and then seeking to remove or remedy them, by every means within our power. "Knowledge is power;" but to make it power to the farmer, it must include the knowledge of his business. This matter is not, we conceive, duly considered. Youths, when they leave school, if intended for any profession, a merchant or mechanic, go at once as apprentices, to learn the business they are to follow, from parties who are competent to instruct them perfectly. Not so with the son of the farmer; on leaving school, where he has learned nothing of his profession, he does not go as an apprentice very probably to a person competent to instruct him, in the best manner, but he returns to his home to practice agriculture as his father does, perhaps, in a very imperfect manner. If it should be otherwise, and his father is competent to instruct him, very probably his teaching and reading at school have given him a distaste to the laborious work of the farmer, and he is more disposed to seek fortune by some other employment that will save

him from labour, and reward him with wealth and station, similar to what some party he has read of at school has attained to. We should not omit to mention that a very highly respectable Roman Catholic clergyman has informed us that he endeavours to give Lectures on Agriculture three times a week at his College. This is an example worthy of all commendation, and if followed up throughout the country would do immense good. We wish we had authority to name the gentleman who has commenced to do what is so much required for the advancement of agricultural improvement.

AGRICULTURAL REPORT FOR FEBRUARY.

The commencement of the month was excessively cold—the temperature falling to 22° below zero, and continuing at a low temperature for several days. Snow fell several times during the month, increasing considerably the quantity already on the ground. The temperature at Quebec was still lower than at Montreal, (28° below zero,) and the snow covers the ground to a greater depth, but this is not to be regretted, as it will be all the better for the land, and protect it from the extreme cold. Animals of all descriptions that are exposed to very great cold, will, undoubtedly, require more food to support them in good condition than they would in moderate weather, and this farmers should attend to, and not allow their cattle to fall off in their condition. If they have sufficient of good hay, nothing can be better, but if fed on straw, a small quantity of oats given to them daily would be a great means of maintaining their strength and condition. This grain is supposed to produce a great degree of warmth to the animals which take it as food, and is very fattening in its nature. If the oats is ground whole, and given in a warm mash, it would answer better than in raw grain; but in any way, it will answer a good purpose. In cutting straw or hay into chaff for neat cattle or sheep, we have been told that it has a tendency

to confine the bowels. We have no experience of this mode of feeding, but in England, cut straw is never given except with turnips, or with boiled linseed sprinkled over it; this always prevents any irregularity of the bowels. In feeding horses with cut hay or straw, it is not so apt to produce any irregularity in the bowels, but even with them it will be prudent to give them roots or mashes occasionally. It is of very great consequence that all descriptions of stock should be regular in the bowels constantly, as it is most dangerous when they are not so, and even should it not prove fatal, the animals suffer greatly in condition while effecting their cure. Careful attention to stock will generally prevent disease, and this will save much trouble and loss. Warm stables, good and sufficient food, and plenty of pure water, are the most essential requisites for stock during winter, as good pasturage, shelter, and abundance of pure water are in summer. Where all these are provided, not neglecting to give them salt and a little nitre occasionally, there will not be much loss of stock; indeed, we believe the proportion of loss would be much under that in the British Isles. We know that losses of cattle occasionally occur here, in summer, produced, we believe, generally, by grazing them in very dry and hot weather, on pastures where the grass is in a dry parched state, where there may not be good pure water for them to drink, and a great want of shelter from a hot sun. The dry parched grass taken into the stomach of animals is said to be incapable of digestion, and hence it produces derangement of the stomach and bowels, and causes death by inflammation of the bowels, if not very soon relieved. All these causes of loss are in the power of farmers to check, if not to prevent, by changing the cattle to pastures more moist and suitable, in very dry and warm weather, and providing good water, and shelter from the heat of the sun. We have had experience in these matters, and know that these causes have produced these results, in preventing and producing dis-

ease. It is on dry, sandy, or limestone soil, that the grass becomes so very much parched and injurious to the animals. It has quite a different effect from regularly saved hay or straw when taken into the stomach. All these matters deserve attention, and, we believe, if attended to carefully, very few farmers will have to complain of much loss in their cattle by death, except from starvation.

Root Crops—Are considered, in the British Isles, the basis of good farming; but from the great difference between their climate and that of Canada, we never can cultivate root crops here in the same proportion, *profitably*. The difficulty of storage in winter, so as to keep them in good condition, will always prevent us from growing a large quantity of root crops for stock. Parties, of course, who have good storage may grow roots in proportion to their means of keeping them safe, but we would not recommend those who have not this accommodation to go to great expense in cultivating roots to rot for want of suitable storage for them in winter. The storage requires to be large, and such as that the temperature can be maintained very little above 32°. If the temperature is much above this, the roots are very likely to heat and spoil, and if below, they will be injured by freezing. In whatever temperature they are kept, turnips, carrots or any roots that have a large proportion of water in their composition, will injure by their own weight, if kept in too large quantities together, and this was one cause that made potatoes so much preferable to any other roots for winter keeping, as they were not subject to heat or injure in cellars, if stored in good condition. The liability of potatoes to disease latterly will prevent their cultivation for feeding cattle. Carrots and parsnips are, perhaps, the next best vegetables to keep in winter, if not stored in too large quantities together, and in too warm a cellar. They will also keep very well in the soil they are grown in, if dry, until the spring, when they come in for use at a very convenient

time for stock. Swedish turnips and mangel wurtzel may be classed next in value for winter keep, provided the storage is suitable, as we before observed, and not put together in large quantities. Any man who has had experience in those matters will be aware how necessary all these precautions are to save roots in winter from destruction. It is most annoying, and a great loss, to see roots become useless, except for the dung heap, after all the expense and trouble of raising and storing them. Roots may be preserved without much trouble till about the 1st of January, and they might be fed to stock up to that time, and thus save other food for the more advanced period of the winter. Ground oats, barley, and Indian corn, might then be fed to them in the very cold weather, and any of these would be much better food for cattle in cold weather than raw vegetables. Crushed linseed occasionally given, mixed with these other articles, would have the effect of keeping the cattle in good health, and they should also be supplied regularly with a small quantity of salt, but not so much as to produce any looseness of the bowels, as it would be injurious to stall-feeding cattle, and indeed to any animals. Ground oats, barley, or Indian corn, will, we believe, be found as cheap and suitable food for the coldest portion of the winter, as any food we can provide for cattle. It will not require so much labour as roots, and the manure of cattle fed on grain or linseed is much better for the soil than that produced from vegetables. It may be objected to this plan, that the lands cannot be kept clean, and in a proper state of fertility, without root crops in proportion to those of grain. We, however, beg to differ from those who may object, and suggest that we may keep our land clean by summer fallow, by sowing peas, beans, vetches, Indian corn, and clover. We do not pretend that this system is superior to the English plan of turnips and other root crops, but we conceive it to be the most suitable for our climate and other circumstances. As we before observed, those

who can grow root crops, preserve them uninjured, and feed their stock with them to advantage, should, by all means, continue to do so. It is only to prevent loss and disappointment to those who are not so favorably circumstanced, that we conceive it necessary to offer these suggestions, and point out modes of improving their lands, although they might not be able to do so by the English system of root crops in proportion to those of grain. There is, however, no farmer who should not have root crops in proportion to his means of keeping them from waste or destruction until fed to his stock. It acts as a great discouragement to improvements when new systems are recommended, because they have been adopted successfully in other countries, without considering whether they are suitable for us or not; and persons who introduce them on this recommendation, and are disappointed, are discouraged themselves, and check the advance of improvement that would be both necessary and advantageous. Great caution is, therefore, necessary in any new plan proposed to farmers, and it is only those who have a thorough practical knowledge of agriculture who can safely take the responsibility of suggesting such changes. Farmers are frequently condemned, very unjustly, for not promptly adopting every imaginary improvement that may be suggested to them, when, perhaps, these so-called improvements might not be possible, and even if they were, might not be advantageous. There is such a wide range for improvement, however, that we may introduce a great many without danger or any uncertainty as to their results, provided they are carried out properly. These subjects may not be considered the most appropriate for an Agricultural Report, but at this season of the year we have nothing to say of the state of the crops, and it may be as well to submit matters for the consideration of farmers, at this idle time, that will have a great influence upon the crops and their value this year.

Improvement of Old Meadows.—Very fre-

quently it is inconvenient to plough up old meadows for the purpose of improving the quality and quantity of the grass upon them, and farmers are desirous to be able to accomplish this object without ploughing them. There is a possibility of doing this in many instances, particularly where there is not much moss amongst the grass; but where the moss is considerable, it is scarcely possible to improve the herbage for producing good meadow, without a regular course of tillage. Draining, and the application of a heavy dressing of lime, would have a good effect; and by repeating this dressing it would probably banish the moss altogether, but it would not restore it to good meadow without sowing fresh grass-seed upon it. We have endeavoured to improve old meadows by top-dressing with compost or other manure, harrowing the land well, sowing timothy and clover seed upon it, and then bush-harrowing or rolling it. We have found this method to answer a very good purpose, and the herbage to be greatly improved by it for meadow. This should be done as early as possible in the spring, when the snow disappears, to give the grass-seeds a fair chance of coming up before the drought and heat of summer commence. Lands that have been top-dressed the previous fall would be in the best state of preparation for sowing the grass-seeds in the early spring, after being well harrowed. In case the land is not top-dressed until spring, it is difficult to do the work sufficiently early at that season, without cutting up the surface by the horses and cart-wheels. By attention to opportunities in the mornings and evenings, while the surface would happen to be frozen, a farmer might be able to top-dress a considerable quantity of land without injury and in good time. This work would be more readily accomplished provided the manure was taken from the farm yard to the field in the winter, and placed in heaps in the most convenient situations. Meadows once properly laid down, and well stocked with the plants of timothy and clover,

might be kept in good condition for several years, by a light top-dressing of compost or other manure, every second or third year. We have ever been persuaded, from observation and our own experience, that top-dressing meadows was one of the most profitable modes of applying manure to the soil. It greatly augments the quantity of provender for stock, without the expense and uncertainty of grain or root crops, and the land is kept in good condition for breaking up at any time the farmer may see it his advantage to do so. Meadows sufficiently drained of superfluous moisture, and kept sufficiently manured, are not apt to become foul with weeds or inferior grass plants. In all good systems of husbandry, good meadows and good pastures are considered much the most valuable portions of the farm. Indeed all improvements are made with a view of laying down lands in good condition for meadow and pasture, but we regret it is not always so in Canada.

As regards meadows, we can have them as productive here as in any other country, and as to the quality of the hay made from timothy, there is not any to equal it, that we have ever seen. At the market of Montreal, the greater part of the hay exposed for sale, is superior for every purpose, to any we have seen on this continent, or in any other country. When we know this to be the fact, we cannot consistently find fault with our soil or climate, because a good quality of hay, produced in abundance, is a certain indication of a good soil and climate for agriculture. When there is good hay, there may be good pasture, and when both are good and abundant, what is to prevent us from having a numerous stock of good cattle and sheep? and when we have those, why should we not have good crops? It is quite possible to raise good crops of roots and grain, on poor soil, by manure and cultivation—but it is not so easy to bring these soils to become good pastures and meadow. Good pastures and meadows are great advantages in all countries, and

where they can be had, there cannot exist any serious obstacle to the introduction of a good system of husbandry, so far as regards climate and soil. All experienced farmers will come to this conclusion, and attribute the backward state of agriculture to the proper cause, and not to any defect in our climate or soil. Flax and hemp are other articles that might be profitably grown here for their seed and fibre, if there were mills to dress the fibre for exportation, or for home uses. We have for twenty years past endeavoured to recommend the cultivation of these plants, and, as a means of encouragement, that, by the Government, or by private enterprise, mills should be erected for preparing the fibre, but all to no purpose, and we fear it will be to no purpose now to bring the subject again before the public. The cost of erecting a mill, where there would be water power, would not, perhaps, much exceed one hundred pounds currency. A mill might be worked by horse power, similar to a thrashing mill, that we have no doubt would answer, and not cost more than a thrashing mill. Farmers will not cultivate these plants until they are certain to be able to dispose of the crop when grown and dried upon the field. If they were assured of this, we should soon have flax and hemp in abundance. We stated some time ago that in France, Holland, and Belgium, flax is purchased dried upon the field, at about £2 10s. to £3 sterling, the ton weight, after the seed is taken off by the farmer. We have been told that in the State of New York the flax is purchased on the same plan, when dried in the field, at about ten dollars the ton weight, the seed being taken off by the grower, and we understand the purchasers of this flax make a good profit of it. As to its being a profitable crop to the farmer, disposed of on these terms, there can be no doubt, and he has the seed besides for sale or feeding his cattle. What, we would ask, is to prevent us in Canada having mills, and cultivating flax and hemp as they do in the neighbouring States? The soil and climate here

are more suitable for these plants than in any part of the Union. We have never yet seen an acre of land properly cultivated in Canada for producing good flax, but let us only cultivate for this crop as they do in Ireland, Holland and Belgium, and we shall grow as good crops as they do. Land requires *deep* tillage, and to be well pulverised and manured for flax or hemp. These are plants that will keep the land clean, and if properly cultivated, will answer all the purposes of root crops, because the land must be clean for them, as both are deep rooted plants, and both pulled out of the ground when harvesting. It is found that flax grown on soil properly cultivated, will push its roots into the soil half the length of the stem above the ground, and the stem is often more than three feet in length. We have introduced these subjects in this Report, as by that means many parties who do not receive the Journal may see what we submit, in newspapers that usually copy our Report. The subjects we refer to are certainly of importance to agriculture, although we may be in error in the view we take of them. Our arable lands require to be better cultivated, manured, and cleaned. If this cannot be generally and *profitably* accomplished by green or root crops, we must take other means to do so, and we beg to suggest the other means that are in our power, always with as much of root crops as we can manage profitably. Farmers will have time to think of our suggestions, and prepare to act upon them, or on better of their own. Changes are necessary in our system, in order to keep our land clean, and in a state of fertile production. There are many farms kept in a good state, but nine tenths of the lands of Lower Canada are not so kept, and it is certain that until they are better cultivated, and managed more judiciously, they cannot be very profitable to their owners, or add much to the wealth or prosperity of the country. Since our last Report there has been no change of consequence in the market prices of agricultural produce, and we

do not see any probability of much change in prices during the winter. Now is the time to provide any seed required for sowing in spring, wheat in particular. Where any of the wheat formerly sown in Canada could be procured it would be well to try some next spring, if it could be sown early. New samples of the Black Sea wheat ought also be procured if possible, as there is no doubt this variety of wheat sown here for the few last years, is now subject to become rusted. We have observed that the straw of this wheat is now quite different from what it was the first two or three years it was sown here. The straw was then hard and wiry, and had a brownish tinge, but the last two years, we cannot perceive that there is any difference between it and that of any other variety of wheat. This matter is of great consequence to farmers and to the country, and should be attended to.

23rd February, 1850.

We are rejoiced to see that there is now a prospect of obtaining correct statistical returns of the state of agriculture in Canada. It is many years since we first brought this subject before the public, but in Lower Canada it was never acted upon hitherto, so as to produce the necessary information. If the returns are correctly made, we may be able to ascertain the true state of agriculture, the general system that prevails, and the results obtained from this system. We shall then see what improvements it is necessary to introduce for amelioration where required, and the best means for their introduction. The statistics of agriculture are more necessary by many degrees than those of trade and commerce, as agriculture is the basis of trade and commerce, without which neither can have any existence. Agriculture will, one time or other, be estimated at its proper value, however unwilling parties may be to admit this fact. Correct statistical returns of the agriculture of the country, will be of great value, and show what are the means we

possess for the support of trade and commerce. Our wood, the spontaneous produce of our forests, is valued highly by many as an article of export, but the expense of preparing, and transporting wood to shipping ports, is so very great that there is not much actual profit realized to the country, and perhaps the same amount of labour bestowed on the improvement of agriculture, would be more profitably employed. We admit, however, that we are not sufficiently acquainted with the cost of producing a load of timber, and bringing it to Quebec, to be able to judge as to what proportion the price it sells for there, bears to the cost previously. We have constantly heard of the uncertainty of the timber trade, and how frequently the labourers employed are not paid in full. If it is a fact that such losses are incurred, the trade cannot be advantageous. A ton of squared timber at Quebec, worth only from 3d. to 4½d. the foot, cannot leave any great profit to those employed in bringing it there; indeed we do not know how it can be brought there for the price. The shipping coming to Quebec must of course be a great advantage, but as to the profit of timber, we cannot so well understand it, if it really costs more before it arrives at Quebec than it sells for when there. There may be many causes producing these results, and the chief cause, perhaps, is, the glutting of the market with a larger supply than is required, and also with a large portion of timber of inferior quality. It should not be forgotten that the cost of transporting timber from Quebec to England is about double the amount of its selling price at Quebec, (when only from 3d. to 4½d. the foot,) and therefore inferior timber cannot sell for much, as it costs as much to take it to Europe as the best quality. It would improve the Timber trade if only that of a quality suitable for exporting was brought to Quebec, and of that quality only what is required annually. This is a subject that may be thought to have nothing to do with agriculture. It has, however, much to do with

the general production of Canada, and we very strongly suspect that any trade, to be profitable, must realize something more than the expenditure.

The Directors of the Lower Canada Agricultural Society, passed a Resolution at their last Quarterly Meeting, to hold a Cattle Show and Great Fair at Quebec next September—and we shall be glad to receive any information or suggestions referring to this Show that might be useful to the Society in forming their plans. It will be desirable that the time fixed upon should not be the same as for the Cattle Show of the Provincial Agricultural Association of Upper Canada, or of the Great Fair and Cattle Show of the State of New York. The month of September would, we believe, be the most convenient time, but perhaps early in the month, the land might not be in good order for a ploughing match, and this might be a considerable draw-back, as good ploughing should be one of the first objects of encouragement with Agricultural Societies. The benefit of annual agricultural exhibitions mainly depends upon there being large collections of stock, agricultural products, and implements, domestic manufactures, and in fact all that would have a tendency to encourage improvement and industry. If there is a collection worth seeing parties will visit the Show and be willing to contribute towards the expenses incurred, as they did at Syracuse last year, and we believe at Kingston. If there is not a large exhibition of animals and other things, Shows are useless. Where there is something to be seen, an interest is created, and encouragement is afforded to improvement and industry. We hope all who are interested in the prosperity of Lower Canada will assist, and do all in their power to make the Show worthy of so fine a country. We invite the County Agricultural Societies in particular to afford their aid to the Lower Canada Agricultural Society, to make it a useful and interesting Show.

We beg to offer the thanks of the Lower Canada Agricultural Society to the Publishers of Agricultural Periodicals in the British Isles, who have kindly sent their valuable publications in exchange for this Journal. We are perfectly aware that the only exchange in our power to offer, is very inferior to the valuable papers forwarded to us, but we hope our fellow subjects in the Parent States will continue their kind aid to assist their friends in this distant part of the British Empire, to promote the improvement of their Agriculture, as the surest means of securing their prosperity in the country of their adoption. To the Secretary of the Highland and Agricultural Society of Scotland, John Hall Maxwell, Esq., and to Edward Buller, Esq., Secretary to the Royal Irish Agricultural Improvement Society, we also beg to return thanks for their valuable presents of the "Transactions" of their respective Societies. These Publications are of great value to the Lower Canada Agricultural Society. We are sorry that we cannot offer our acknowledgments to the Royal English Agricultural Society, as they declined to send us their published Transactions in exchange for this Journal, although we applied to the Secretary and to several members of the Council, requesting them to do us this favour.

We have seen in our late exchange papers a statement of a gentleman that he had thorough drained land at a cost of eight shillings the acre. Willow tops or thorns are said to be the best materials, and these are put into drains, cut eighteen or twenty inches in depth, with the plough, we suppose. These drains so constructed, are said to continue good eight or ten years, and can then be repaired or renewed at the former cost. We have not seen a full description of the mode of making these drains, but we shall obtain it. They are said to succeed very well in clay soils, that previously used to set like bricks, after a few days of dry weather, when the soil had been soaked with moisture. The plan is well worthy a trial here,

when it can be so cheaply executed. The drains, we suppose, are cut as for tiles of small size, and the small tops or branches put into them, and covered, permit the water to percolate through them, better than it might do, if straight poles were made use of. If this plan of draining will answer, every farmer may drain his land. The simple hint that such drains have been constructed may induce farmers here to consider of the matter, and even improve the plan. All that is wanting in thorough draining is to make such drains as will allow the water to escape through them. We may imagine that small tops of thorns or other branches placed in a drain would allow of the passage of water, provided the branches were such as not to lie too closely together. We again repeat, the plan is entitled to a fair trial; in clay soil the effect of frost may be an objection, but at this depth, the drains would be free from frost nearly as soon as the soil would be dry enough to work. Experiment will, however, settle the matter—and it will not be expensive. What we would most apprehend is that, at this depth, the action of the frost might cause some of the clay of the sides of the drains to fall in and mix with the branches in the drains, and thus prevent the free discharge of water through them; this we believe will be the greatest objection.

“We have seen a very good article in the *“Gardeners and Farmers Journal,”* on the subject of feeding cattle in yards and sheds, and as it disapproves of the plan, we perfectly agree with it. We decidedly think, that in general, the usual plan of feeding animals upon their pastures, is the best, the most healthy, and most economical mode, and we are convinced that lands will be more improved for any purpose, by pasturing animals upon them, than they would be, by keeping these animals confined in summer, feeding them with the produce obtained from the land it would take to pasture them, and returning the manure made by them in sum-

mer, while consuming this produce, as top-dressing upon the land. If this would be the case, all the labour and trouble attending the cattle would be saved. Animals will do better kept in the natural way in summer, providing them with sufficient food, water, and shelter, than by the artificial mode of confining them, and feeding them in yards or under cover. A working man having only one cow and a small quantity of land, might do better by feeding the cow under cover, and parties having only small farms, all in good cultivation, might also find it convenient and advantageous to confine their cattle in summer; but in ordinary farming, the natural and usual mode of pasturing cattle we think much preferable, and the least expensive. It may be objected that the drought and heat of our summers dry up the manure that falls from cattle on pastures, but, however this may be, the improvement of soil pastured by cattle and sheep is unquestionable, even in this hot country. When lands are of good quality in the old countries, and growing a good variety of grasses, there is the greatest objection to break them up. We had land in our possession in Ireland, which was understood to have been kept in meadow and pasture, without being ploughed, for a term of 150 years, and for 50 years of this term, while in the hands of our family, it produced excellent meadow one year, and was pastured the next during the whole time, sheep being generally the stock fed and fattened upon it. A farm under good management, with the due proportion of stock upon it, increasing the manure in every way possible, by compost, &c., preserving the manure from waste, and applying it judiciously, may be kept in very good condition, unless a large portion of the straw or hay is sold off the farm. The grain sold off, if considerable, may in many cases, require to be compensated for to the soil by more manure than can be produced upon the farm, but by summer fallowing, any hurtful exhaustion to the land might be prevented, if there was no means of obtaining any manure

off the farm. Parties may imagine agriculture to be a very simple affair, perfectly easy to any capacity or training, but this is a great mistake, as in reality no business requires more judgment, more experience, and more careful attention, to practice with any chance of credit or success, than that of the husbandman.

The Royal English Agricultural Society and the Highland and Agricultural Society of Scotland, give large Premiums for the best Essays on various subjects connected with Agriculture, and by this means obtain valuable and practical information, which is published and circulated extensively, to the great advantage of farmers. There are many circumstances favourable to the useful action of the great Agricultural Societies of the British Isles. The wealthy landed proprietors are deeply interested in the objects for which these Societies are organized, and consequently are willing to contribute liberally towards their support. It is not so in this country, the landed proprietors are not so greatly, or so *directly*, interested in promoting Agricultural improvements, therefore they do not feel called upon, generally, to contribute largely towards the support of Agricultural Societies. The Provincial Agricultural Societies of Canada cannot consequently have sufficient funds at their disposal to do all that would be necessary and expedient to encourage the improvement of our Agriculture, without aid from the Provincial Revenue, and we humbly conceive that such appropriation, to a reasonable extent, would be one of the most advantageous for the Province at large, that could be made. If they were so circumstanced as to be able to offer various premiums for practical Essays on the best modes of cultivating various crops, the best dairy management, the most suitable and profitable breeds of stock, and the best modes of feeding and breeding horses, neat cattle, sheep, and swine, and then publishing this information, and circulating it throughout every section of

the country to the remotest corner of it, it could not fail to produce immense benefit, that would amply refund to the Revenue any advance granted to the aid of the Societies. This is the mode by which Agricultural improvement can be most certainly promoted, and encouraged, and by model farms, and if such improvements are desirable and would be advantageous, it can only be effected by these means. The dissemination of useful and practical information, through the County Agricultural Societies and at all the country schools, would unquestionably create an interest and desire for improvement, that has not existed hitherto, amongst the rural population. Every County Agricultural Society should be obliged to take a certain number of the Journals published under the control and superintendence of the Provincial Societies, for distribution as prizes or otherwise, and they could be afforded to them at a very low price, when the numbers required would be large. By these means, the best and most practical information and instruction relating to the practice of husbandry, would be widely circulated, not for the instruction of those who are already good farmers, but those who are not so fortunate as to understand their business to perfection. Such are the grounds upon which alone we conceive that Legislative aid can be asked or expected by Agricultural Societies, namely, to instruct and encourage a better system of husbandry, where it is most required.

We have been informed that 15 cents, nearly equal to 9d., would be paid here for good salt butter put up in suitable casks. The butter should be of uniform colour, saltiness, and quality, not, as it is frequently here, more than half a dozen different colors and qualities, and put into the cask as if *thrown* in, and not packed closely together. Butter put up in this careless and slovenly manner is not worth much more than half what the same butter would be, properly managed. Is not this

alone a great loss to the farmer, where there is no excuse for such neglect. The tubs or casks that butter is generally put into are so made that they not only admit the air, but dust and other substances that give the butter anything but a neat and clean appearance. We have for many years endeavoured to persuade farmers to adopt a better system of making and packing butter, but it appears to have no effect, and this article is constantly brought to market greatly deteriorated in quality, and scarcely ever fit for exportation to England or the neighbouring States, where there would be a good sale for good butter. The profits on milch cows is hence decreased one third or one fourth without any necessity, as we know that as good butter might be made here as in any part of the world, by careful and judicious management.

Timothy Seed. There is a considerable demand this year for timothy seed, and this seed the farmers should not neglect to raise in abundance, as there is constantly a good demand for it, and likely to increase for exportation. Farmers might raise and save this seed without much loss to the crop. The grand point is, to save it clean and unmixed with any other seed. It is a great loss when sowing what you expect to be clean timothy, to be sowing instead a large portion of seeds of weeds or worthless grasses. There is not in any country, more beautiful and clean timothy grown than in Canada, so that pure seed may be saved, if farmers who have it good and unmixed with other grasses or weeds, would save the seed. We recommend this matter to farmers' attention.

Complete copies of the Agricultural Journal, for the years 1848 and 1849, both in English and French, may be had by application at the Rooms of the Society, 25 Notre Dame Street—some are half bound. Also for the years 1844, 1845 and 1846. Evans' Treatise on Agriculture, both in English and French, may be had at the same place.

DRAINING.—We have been told by a gentleman who has made use of small poles for draining, that they answer well in Canada. His drains are made as for tiles, narrow at the bottom, and he then places eight or ten small poles, the size of hop-poles along the bottom of the drain, filling it up, perhaps, to the depth of twelve inches. He then places some small branches or other substances over the poles, and fills in the earth. The poles are laid in a slanting direction, so as to prevent the ends of them terminating at one place and they thus form a continuous line of poles resting upon each other, and all the joinings broken by this means. Where there is a facility of obtaining small poles, which we conceive to be the best for the purpose, we have not any doubt that they would answer well in drains. When small ones cannot be had, those of larger and longer size might be made use of, when, we suppose, five would be sufficient. In all cases, the poles should have some covering to keep the clay from getting amongst them—and it is also necessary not to have all the ends of the poles coming together at one place, but to break the joinings, by slanting the poles, putting down only one pole at one place, and the next at a distance equal to the fifth part of the length of the poles, (if five be the number made use of,) and so continuing until the drain is finished. In making covered drains of whatever material, the greatest care and attention is necessary.

The necessity and profit of changing seed is well known to many farmers. We knew a gentleman in Ireland, who was an excellent farmer, and raised very good crops, but he made it a constant rule to import his seed wheat from England annually, of the best quality he could obtain. This seed cost him, including all expenses, we suppose, nearly double what his own would have sold for on the spot, but he still thought it was profitable to make the change. The seedsman of the Lower

Canada Agricultural Society, Mr. George Shepherd, has an opportunity of showing samples of seed at his store, and any farmers having seed to dispose of should send samples to him, with an accurate description of the variety of grain, the soil grown upon, the quantity produced per acre, and the time of sowing and harvesting. This would give farmers an opportunity of making a change of seed, at a trifling cost. Changing from one variety of soil to another has an excellent effect. Above all things, unmixed varieties of seed should be obtained if possible, and it is expected that any farmer sending samples to the seedsman, will be particular in describing it as it is, and whether it is a mixed variety or not, as every farmer must know this while the grain is in the straw. Mr. Shepherd is well supplied with every description of seeds necessary for the farmer, and sells them on moderate terms.

We have received a communication from a highly respected correspondent, who has kindly complied with our earnest solicitation for assistance to make this Journal more useful. The communication being in French, we fear we shall not be able to give it insertion in this number of the Journal, but it shall appear in the French number for March. It affords us much satisfaction, to find that our correspondent coincides with us in opinion as to the necessity of an agricultural education for the sons of farmers. We hope this subject will not be allowed to rest in this position, but that it will receive all due consideration from the Government and Legislature. Our respected correspondent will confer a great favour upon us, and do much good to the cause we advocate, by continuing to write to us. We are the more anxious for this, because we know that he feels deeply interested in promoting the improvement and prosperity of Canadian Agriculture. We have also received two communications from a farmer correspondent, for which, we beg to thank him.

We would earnestly request all parties who receive this Journal to pay their subscriptions as soon as possible, to the Agents, where there are Agents appointed, or to forward them to us at the office of the Society. The publication of the Journal is a considerable expense, and the annual subscription the very trifling amount of one dollar. To employ collectors to travel over the whole country, would be a serious draw-back to the amount of subscriptions. The Agents we would beg to collect the subscriptions and forward them with as little delay as possible. Those who have enrolled their names as members of the Society, or who may now do so, we beg to remind of paying their annual subscription of five shillings.

We were very sorry for the omission in the Journal for February, of the notice we had prepared of the District Agricultural Show which was to have taken place at Henryville on the 15th February. We had written the article, but it was not inserted. We had it translated, however, and it was published in the French Agricultural Journal on the 10th of February. There was not any request made of us to notice the Show in the Journal; we only received a printed handbill through the Post-Office. There are some of the observations which we had prepared that may not yet be out of place to publish, as they refer to the mode of distributing premiums for samples of grain, and may be as applicable to any future Show as they were to that held at Henryville. They are the following:—

We observe in the Premiums offered at the District Cattle Show, to be held at Henryville on the 15th February, that six are for wheat, each parcel to consist of five minots, making in all 30 minots, and the premiums amounting to 33 dollars. For peas, barley, and oats, there are four premiums offered for each, amounting to 26 dollars for each. For Indian corn in the ear, there are six premiums offered, and each lot to consist of two minots, *in the ear*. The total amount of the latter premiums is the same as for wheat, 33 dollars, being at the same rate,

five dollars and a half for each lot of two minots, in the ear. We conceive there is an objection to this mode of distributing premiums. In the case of wheat, the premiums offered were fully equal to the value of the whole of the wheat exhibited. There could be no objection to this if the wheat had remained the property of the Society, to be sold or distributed as seed. For the oats, peas, and barley, the premiums given are, for the first, more than six times its whole value, and for the latter two, more than three times their actual value. The Indian corn, of which 12 minots were to be exhibited in the ear, was awarded 33 dollars, which we suppose was ten or twelve times its value, and all these articles remain the property of the exhibitors. The most judicious mode of awarding premiums on grain, is for the crops growing in the fields, but by the District Society this perhaps could not be done. But if premiums are given on samples, the samples should belong to the Society. We have no objection that sufficient amounts should be awarded to satisfy the exhibitors, but the samples should not belong to them, that perhaps were picked for obtaining a premium. The country at large should have the advantage of this picking, if they consent to pay for it.

The Representative Assembly for the State of New York have proposed the following "Resolutions" on the subject of a separate Department of the Government for the special superintendence of Agriculture:—

Resolved, (if the Senate concur,) That the people of the State of New York regard Agriculture as the leading pursuit of the American people, and therefore eminently deserving the attention and care of the Federal Government.

Resolved, (if the Senate concur,) That the people of this State earnestly desire the establishment in the Home Department of a Bureau of Agriculture, for collecting and diffusing useful knowledge on agricultural subjects, and for such other purposes as may advance the interests, increase the wealth, and promote the general prosperity of the farming population of the United States.

Resolved, (if the Senate concur,) that our Senators and Representatives in Congress be respectfully requested to use their best efforts to procure the establishment and successful operation of such a Bureau.

The people of the State of New York, through their Representatives, appear to estimate agriculture at something like the importance it is entitled to. We wish sincerely that the people of Canada would follow their example in this matter, and in all that energetic people do, to promote the improvement and prosperity of agriculture. Our visit to the great Fair at Syracuse last September, demonstrated to us in the most unmistakable manner, what a great interest the whole population of the State of New York, and in fact of all the Northern States, feel in the prosperity of agriculture, and in every thing that may promote its improvement. It is not, as with us, that all parties *admit in word* the importance of our Agriculture, but they do not generally appear disposed to take any further action in the matter. We certainly have exceptions; but we regret that the general disposition to promote the improvement and prosperous condition of the principal interest in Lower Canada is wanting, so far as we are capable of judging, more particularly as compared with our neighbours of the United States. Who can satisfactorily account for this, for we cannot? The energy, industry, perseverance and "go-a-head" principle of the citizens of the United States, are constantly talked of with us, and they are worthy of all praise and commendation for these qualities. But why do we not follow their example, and strive to excel them in all these good qualities, if we can? It would undoubtedly be an honorable competition, and there is nothing under heaven to prevent us engaging in this honorable contest, that we are aware of—except the will to do so. While we are quite disposed fully to admit all the good qualities of our elder brothers south of line 45°, and indeed to feel their good qualities creditable to us, as relatives, we will not for a moment admit that we are inferior to them in any respect, that would prevent us competing with them in the honorable and patriotic contest of improvement of our country and our

condition, and with a very fair chance of being successful, if we only commence the contest at once, before our friends are too far a-head of us. We should be sorry to suppose that our lot being cast on the north side of line 45° should render us inferior to our friends on the south side of that line, and we hope there is not an inhabitant of Canada who would admit it to be the case, and if there are any who do admit it, they cannot estimate their country very highly. We should be very unfit to act in the capacity of Editor of this Journal, if we had not the most favorable opinion of this country, and of its capabilities for an improved system of husbandry, and with profit to the agriculturist. Our opinion, of course, may have no influence with others on this subject; but we shall be always ready to defend this opinion, and show the grounds upon which we have formed it. There may be obstacles that act as discouragements to agriculture, but we maintain these can be overcome by our own exertions properly organized, and united. This is an agricultural country, and the population, in the proportion of seven-eighths perhaps, are farmers or engaged in husbandry. What should prevent them under such circumstances, from doing all that would be necessary for the interests of agriculture? Any plan of improvement that agriculturists unite in supporting, they cannot fail to be able to introduce, because it is in their power to do so. They have, therefore, no reasonable cause of complaint, when they can remedy any evil they have to complain of, and introduce any improvements that are desirable for the general good. The "Associations of Agricultural Credit" we again recommend for consideration, and shall do so continually until it can be satisfactorily proved that they would not be beneficial, but injurious to the country. Building Societies have been incorporated for the purpose of enabling parties to build houses. Parties who have borrowed money to build can better explain their advantages than we can. But of this we are certain,

that capital employed for the improvement, and to increase the productions of agriculture would be much more beneficially employed for the general advantage of Canada, than in building houses, or extending cities. The plan of "Associations of Agricultural Credit" is not to be rejected on slight grounds, without examining the system thoroughly, as it is reported to be in successful operation in other countries. If the system could be introduced here, for the advantage of agriculture, we cannot see why they should be denied this advantage. The experiment could first be made on a small scale, to see how it would answer. Conducted upon the same principle as in Europe, it could not fail to produce an improved system of agriculture, as no farmer could obtain any accommodation from it, if he did not cultivate his lands properly. We trust, for the sake of agriculture, and those who are dependent upon it, that this subject will receive the most serious consideration, and that it will not be rejected, to favour other interests, without sufficient cause.

We have much satisfaction in reporting, that several County Agricultural Societies have ordered a number of the Agricultural Journals, in both English and French, for distribution in their respective Counties. The following are the Societies:—The Quebec, Gaspé, Nos. 1 and 2 Drummondville, Sherbrooke, Richelieu, No. 1 Rouville, Berthier, Nicolet, Dalhousie District. One of the gentlemen of the County of Richelieu Agricultural Society informed us that each party who received a number of the Journal, was obliged to make its contents known to his neighbours, and keep the Journals safe to the end of their term as Directors of the Society, and then deliver them up to the next Directors, to be kept together for the use of the Society. If all the County Societies were to act thus, the Journal would be well supported, and we believe it will be admitted that much useful information would be circulated throughout the

country by this means. It is only now that the benefit of publishing an Agricultural Journal is becoming known, and we confidently hope that all the advantages that were expected to be produced by those who first organized the Lower Canada Agricultural Society, will be fully realized to the country in due time. It is not to be expected that the general improvement of Canadian Agriculture could be accomplished in a year, or in many years, but a commencement has been made with the most favourable prospect of ultimate success, if persevered in with united energy. Of course the Society requires to be supported by the farmers, and by public opinion, and while their object is the improvement of Agriculture, they may reasonably expect this support. As to Agricultural Societies, who receive public money to encourage the improvement of Agriculture, we cannot see how they could employ, suppose £5 annually, better, than by taking 20 numbers of the Agricultural Journal for distribution, as premiums or otherwise, in their respective Counties. As we have repeatedly observed, if the Journal is not so useful as it might be, those who can improve it, may communicate their ideas to us, and we shall be happy to give them insertion, for the benefit of farmers. The Journal is the proper medium for communicating useful and practical information to the agricultural population. It must be very badly managed indeed, if it does not contain, in a year, information that would be of much more than five shillings value to any farmer, however competent he may be. We have the very best publications on Agriculture, that can be had on this continent, or in Europe, to select from, and with our own practical knowledge as a farmer, and the communications of our friends, it would be strange if we were not able to make the Journal worthy of encouragement. This Journal is exclusively devoted to agriculture and its interests. Can it be possible that it should lack support in this agricultural country.

THE FRENCH FARMERS.—I was in the midst of the land of grapes, travelling for miles and miles, and day after day, through vineyards loaded with their products, and seeing hundreds and hundreds of men, and women, and children, gathering the most abundant harvest which has been known for years. I have never seen, so far as they have come under my observation, a more civil, clean, well-dressed, happy set of people than the French peasantry, with scarcely an exception; and they contrast more strongly, in this respect, with the English and Scotch. I seldom went among a field of laborers in England or Scotland, especially if they were women, without some coarse joke, or indecent terms; and seldom without being solicited "to drink your honor's health;" and never, especially in Scotland, without finding them sallow, haggard, bare-footed, ragged and dirty. In France it is the reverse; they are well clad, with caps as white as snow, or neat handkerchiefs tied around their heads; the men with neat blouses or frocks, and good hats. I have scarcely ever seen a bare-footed or a bare-legged woman in France; let them be doing what they will, they are always tidy; the address of even the poorest (I do not, at all exaggerate) is as polite as that of the best people you find in a city; and so far from ever soliciting money, they have repulsed it in repeated instances, when, for some little service, I have offered some compensation. Count de Conrey told me again and again, that even the most humble of them would consider it as an offence to have it offered to them. I do not believe there ever was a happier peasantry than the French; drunkenness is entirely unknown among them; and they are pre-eminent for their industry and economy. I went into one field, with a large farmer, where there were nearly a hundred, principally women and children, gathering grapes, and I did not see one among them, whom I should not have been perfectly willing to meet at the table, or in any other situation. I visited several plain substantial farmers, and several of the old nobility. They do not live in the same splendour as the English; they have not so many horses and carriages and servants; but they live elegantly. Their houses are most comfortable, and their tables are covered with more luxuries than I almost ever before saw brought together in the same abundance.—*H. Colman.*

POTATOES AND SALT.—Last spring I took a bushel of yellow potatoes from among the diseased ones, which had still a few good ends left. I put them into water saturated with salt. A pound was used; a larger quantity of water might have been saturated with the same quantity of salt. These tubers were set near other potatoes, not diseased. When taken up I had three bushels of good potatoes, and half a bushel

of diseased. This is a satisfactory result ; inasmuch as the good potatoes set in the vicinity were half diseased. In two previous years I have had the same result ; and I therefore think myself entitled to assert that the potatoe disease may be stopped by soaking the sets in brine. A pound of salt to two bushels is enough ; the salt must be dissolved before the potatoes are put in, and the soaking must last for half an hour.—*Newman.*

RECIPE FOR LINSEED COMPOUND.—Perhaps the following, given me by an intelligent native of Norfolk, (the original county of box and linseed feeding,) may not be uninteresting or useless to some of your readers at the present season :—

Put 150 lbs of water into an iron cauldron, and let it boil, then add 15 lbs. of crushed linseed, the same to boil until the froth begins to rise, stirring it well ; then add 50 lbs. of crushed barley ; boil it until it becomes of a consistency like brick earth, when it is fit for the mould, not forgetting to stir it the whole time. Should more than one copperful be wanted, let the fire be backed up with wet coals, closely beaten down until the compound is taken out ; during this let the furnace door remain open. When the compound is put into the mould, have a small piece of board like a bricklayer's hawk, and pat it down to level it ; then replenish the copper, break up the fire, close the furnace door, and the water will boil very soon : in the meantime, the man to turn the compound and lay it on shelves, similar to bricks on a hake.

A different method must be observed in boiling compound, consisting of crushed beans, peas, barley, and linseed, viz. : put 150 lbs. of water, add 15 lbs. of linseed, and boil them as before ; then add 17 lbs. of beans, and 17 lbs. of peas ; boil them 20 minutes, stirring them continually during the time ; then add 17 lbs. of crushed barley—the whole to boil until they become of the consistency before mentioned.

DIRECTIONS FOR MAKING MOULDS.—Take a piece of deal six feet long by nine inches wide, with sides and ends four inches deep, made rather slooping, with twelve partitions in it, the lower edge next to the bottom being twice the thickness of the upper one. Three of these are sufficient for the quantity above mentioned.—The compound will keep good for three weeks.

ON MAKING BUTTER.—The best land for grazing is old pasture, as free from weeds as possible, with abundance of good water. The cows should never be fast driven, heated, nor tormented in any way. They should be housed at night, fed on green food, and the pasture changed when practicable. When going to milk, take saltpetre in the pail, one-eighth of an ounce to every eight quarts of milk.

The dairy should be kept very clean and airy and as near the temperature of 50° F. as possi-

ble, with very little light, and completely shaded from the sun, in summer, by trees, or otherwise. Strain the milk into coolers sweet and dry, (never mix warm and cold milk,) keep it from two to four days, then put the whole of the milk and cream into a clean churn, which is not used for any other purpose but the one intended. Boiling water is to be added to raise the temperature of 70°. Care should be taken not to continue churning beyond what is absolutely necessary.

After churning, put the butter into two bowls or pans of pickle, made from pure water and fine rock salt, dried in a stove or by the fire, as common salt, obtained from springs or ocean, gives the butter a bad flavour. It should then be well washed, and the pickle changed frequently, until all the milk is extracted, working with the hand the two parcels alternately, until the grain becomes quite close and firm, when it is to be cured with the finest dried rock salt and sugar, in the proportion of one ounce of refined sugar to a pound of salt to be worked into the butter with the hand, until the pickle is driven out. The butter should be finished the day it is churned, and then packed as closely as possible into a cask, if it is not intended for immediate use, which should be well seasoned, for some days previous, with strong pickle, frequently changed. The cask should be strong and air-tight, and if not filled at one churning, the butter should be covered with pickle until the next ; but no cask should contain more than one week's churning. If the butter should, at any time, appear pale in colour after the churning has commenced, a little grated carrot juice may be added, which will not injure either the butter or milk.

AUCTION SALE OF FRUIT TREES, &c.

I THE undersigned is authorised by the Proprietor of ROSEBANK NURSERY to state, that, as early after the opening of the navigation in spring as possible, there will be a Sale by Auction, in this City, (similar to that which took place this fall) of Apple Trees, a fine assortment of suitable named sorts.

Pear, do	do	do	do.
Plum, do	do	do	do.
Cherry, do	do	do	do.

TOGETHER WITH

Raspberry Bushes, Strawberry Plants of fine named sorts, Roses, and various Ornamental Trees and Shrubs.

The healthy condition of these Trees and Plants, and the accuracy of their names, may be depended upon, and the sale will take place in good time for subsequent spring planting, which is the safest, at any rate, in all northern climates.

JOHN DOUGALL,
Montreal Witness Office,
Agent for Rosebank Nursery.

Montreal, November 30, 1849.

CANADIAN GLASS MANUFACTORY,

NEAR SNYDER'S LANDING, VAUDREUIL,
Erected and carried on by Messrs. Boden
& Le Bert.

THE Proprietors of this establishment are prepared to Manufacture LOOKING GLASS PLATE and WINDOW GLASS, of every size, coloured and fancy, according to patterns or orders. Shades for Oil and Gas Lamps, plain, tinted, or coloured, in the richest hues—Coloured Glass of any pattern for Churches, similar to those of European Churches; also, for Cottages, Gardens, Houses, and Steamers—Bottles and Vials for Druggists made to order.

—ALSO,—

SODA, GINGER, and ROOT BEER BOTTLES, with or without the maker's name.

—AND,—

MILK CANS, of suitable sizes.

All these articles shall be of the very best quality and disposed of on reasonable terms; and the proprietors solicit a share of public patronage, and the examination of their Manufactures.

For orders or further particulars enquire of the proprietor, at the People's Hotel, No. 205 and 207, Notre Dame Street, Montreal.

Vaudreuil, January, 1850.

FARMING IMPLEMENTS.

WE, the undersigned, certify that we have carefully inspected a variety of Farming Implements manufactured by Mr. A. Fleck of St. Peter Street, and we feel great pleasure in recording our unqualified opinion that they are very much superior to any article of the kind which we have seen manufactured in the country, and equal to any imported.

And we would particularly recommend to the notice of Agriculturists throughout the Province his Subsoil Grubber, which he has improved upon from one which took a premium of £10 from the Highland Society of Scotland. This implement seems well adapted to improve and facilitate the labours of the Farmer, and we cannot doubt that it will soon be extensively used in improved cultivation. His Scotch and Drill Ploughs are also very superior, and well worthy of the inspection of every one desirous of possessing a valuable article.

M. J. HAYS, Cote St. Antoine,
President M. C. Agricultural Society.
P. P. LACHAPPELLE, Sault au Recollet.
WM. EVANS, Sec. L. C. Ag. Society.
JAMES SOMERVILLE, Lachine.
EDWARD QUINN, Long Point.
T. E. CAMPBELL, Major, Civil Secretary.
HUGH BRODIE, Cote St. Pierre.
P. F. MASSON, Vaudreuil.

REAPING MACHINES.

THE Subscriber has on hand three REAPING MACHINES of the latest and most improved construction, capable of cutting twenty-two acres per day. Being manufactured by himself, he is prepared to warrant both material and workmanship as of the best order. Price moderate.

MATHEW MOODY, Manufacturer.

NEW SEED STORE.

THE Subscriber begs to acquaint his Friends and Customers that he has, under the patronage of the Lower Canada Agricultural Society,

OPENED HIS SEED STORE,

At No. 25, Notre Dame Street, Opposite the City Hall, Where he will keep an extensive assortment of AGRICULTURAL and GARDEN SEEDS and PLANTS of the best quality, which he will dispose of on as favourable terms as any person in the Trade. From his obtaining a large portion of his Seeds from Lawson & Sons, of Edinburgh, who are Seedsmen to the Highland and Agricultural Society of Scotland, he expects to be able to give general satisfaction to his Patrons and Customers. He has also made arrangements for the exhibition of samples of Grain, &c., for Members of the Society, on much the same principle as the Corn Exchanges in the British Isles. He has a large variety of Cabbage Plants, raised from French seed, which he will dispose of to Members of the Society, at one fourth less than to other customers.

GEORGE SHEPHERD.

Montreal, April, 1849.

NOTICE.—Some excellent Barley and Oats for sale, for seed, the produce of seed imported expressly last Spring from Britain—Samples to be seen at Mr. Shepherd's Seed Store.

Montreal, January, 1850.

Agents for the Agricultural Journal.

H. Aylmer, Esq.,.....Melbourne and Ship.
Capt. Stewart.....Clarenceville.
R. J. Robins, Esq.,.....Pointe à Cavignol.
Rev. F. Pilote.....College of St. Anne.
Dr. Grosbois, M. D.....Chambly.
Dr. J. H. R. Desjardins.....Green Island.
Dr. Conoquy.....St. Cesaire.
Dr. De la Bruère.....St. Hyacinthe.
Mr. T. Dwyer.....St. Pauls, Abbotsford.
Paul Bertrand, Esq., N.P.....St. Matthias.
Thos. Cary, Esq., (Mercury)...Quebec.
Dr. Smallwood.....St. Martin, Isle Jesus.
Robt. Ritchie, Esq.,.....Bytown.
Major Barron.....Lachute.
L. Guillet, Esq.,.....Three Rivers.
Hon. F. A. Malhiot.....Verchères.
J. B. E. Durocher, Esq.,.....St. Charles, Chambly.
A. C. Cartier, N. P.....St. Antoine.
John M'Lauren, Esq.,.....Murray Bay, Sag.

All communications connected with this Journal, to be addressed, post paid, to the Secretary of the Society—WILLIAM EVANS, Montreal.

Annual Subscription for the Journal, five shillings.

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AGRICULTURAL JOURNAL, AND TRANSACTIONS

OF THE
Lower Canada Agricultural Society.

VOL. 2.

MONTREAL, APRIL, 1850.

NO. 4.

We have very frequently endeavoured to show the unreasonableness of objecting to "Book Farming," if what is proposed to us in books is reasonable. There is much, certainly, to be found in some agricultural works that may not be practicable or practical, but this is no good reason that we should reject any sound and practical information or useful suggestions, because they are submitted to us in a printed form. We should not know what to think of a farmer who would reject useful information or suggestions he would see in a book or periodical, on the absurd grounds that he had not seen the practice recommended, suggested or proposed, in operation. How or when are we to expect to see the necessary improvements introduced in Canadian husbandry, if we are to wait until there is a Model Farm established in every parish to show these improvements in actual practice? By all means farmers should reject any plans of improvement proposed to them, either in books, periodicals, or otherwise, if they should have reason to believe that what was proposed would be impracticable or unprofitable; but by the same rule they should willingly adopt any reasonable proposition of amelioration that was in their power, whether proposed to them in a book, periodical, or in any other way. There may be agricultural works published, and periodicals conducted by parties who are not practically acquainted with their subject, but this is not always the case, and therefore farmers will act very much against their own interest when they reject all they see in agricultural books or periodicals.

In conducting this Journal, we frequently, or we might say constantly, go into lengthened explanations of any change of system or plans of improvement we submit, in order to show farmers the grounds upon which we make our propositions, to prove to them the defects that exist in their practice, and the probability of the favourable results that would ensue from adopting the changes we propose to them. We acknowledge we do this, in order to gain their confidence in our humble exertions for their advantage. We know that this confidence is necessary to the success of this Journal, and to the introduction of the plans of improvement we may suggest from time to time. If we should happen to propose or suggest any changes in our agricultural system or practice that are of a doubtful character, we would earnestly request of parties who would be of this opinion to communicate with us, and allow an opportunity of discussion. It cannot serve or promote the cause of agricultural improvement to denounce as "Theory" and "Book Farming" the suggestions we may feel it our duty to submit occasionally for the consideration of farmers. It would be a much better plan, if our "Theory" be good, to put it into practical operation and give it a fair trial, and if it succeeds, recommend it for general adoption. We shall always be very cautious in recommending changes, except where we are perfectly satisfied they are necessary—they are practicable—and would be advantageous, if properly carried out. We are aware it frequently happens that suggested changes and

improvements are *attempted* by parties who do not carry them out properly to give any chance of their succeeding, and then when they fail, the parties who only *attempted* what was proposed, turn upon those who suggested the changes, and abuse them as "Book Farmers," "Theorists," &c., when the fault is altogether in themselves, for not executing properly the improvements recommended. We have seen this frequently—parties complaining of their want of success in raising crops according to plans proposed to them, when they neglected the most essential things. Thus it is in reporting the results of experiments, we scarcely ever see such reports of any value as a precedent or guide to us, because most essential circumstances are not mentioned. This must proceed either from ignorance of practical agriculture, or a design to withhold the information that would make such reports useful. Agriculture is an art that requires the most diligent application, long experience, extensive practice, and an ardent desire to be a good farmer, to understand it perfectly. We submit these observations to the subscribers to this Journal. We respectfully solicit their confidence. We can assure them we are most anxious that the Journal should be useful—many who receive it are capable of assisting to make it much more valuable than it is, and we beg they will afford us their aid. The improvement of agriculture is the sole object of publishing this Journal by the Lower Canada Agricultural Society, and they have incurred a considerable responsibility for this purpose. All who are favourable to this object should render their assistance and give the benefit of their skill and experience to forward it. Their practice will be the best instruction for others, and it will afford us the greatest satisfaction to have our own "Theory" corrected where we may be in error, as we have no desire to recommend faulty systems of agriculture to farmers, and shall never consider ourselves too old to learn.

We learn from the *Gaspé Gazette*, that at a recent meeting of the Agricultural Society of the County of Bonaventure, the Council awarded a premium of 20s. to Mr. Kell, for introducing into the District a Subsoil Grubber and an improved Drill Plough, made by A. Fleck, agricultural machinist of Montreal, the President regretting that the funds of the Society did not enable them to give further encouragement for the importation of improved implements. The 20s. was immediately handed back to the Treasurer, as a subscription from Mr. Fleck, who is now a member.

We are glad to perceive that the Agricultural Association of Upper Canada, have, at a late meeting, resolved to offer premiums for several articles of Canadian produce and manufacture, with a view that the articles awarded these premiums should be forwarded by the parties exhibiting them, to the grand Exhibition of the industry of all nations to be held in England next year. This is what might be expected but we believe it requires more consideration in order that sufficient inducement may be held out to those who succeed in obtaining premiums to forward those articles for exhibition in England. Perhaps this could be better accomplished by the Association, as it would not be reasonable to expect that a party who might have one of these articles would send it to the Exhibition or go with it. If any parties undertook to forward their own articles to England, and to take their chance at the Exhibition, it would be well, provided they were sure to do so, or if they did not, that they should refund the premiums to the Association. We conceive the best plan would be, that all articles obtaining premiums for the English Exhibition, should be given in charge to the Association with the names and residence of the owners of each article appended to them, and that they should all be forwarded to England at the proper time by the Association, under the charge of a suitable deputation, and that the owners of

these articles should be entitled to the premiums, if any, obtained in England, and the articles might be sold there for their benefit. The expenses, &c., to be arranged previously with regard to the proportion each article was to be chargeable with. The expenses might be considerable, but we have no doubt, if the articles sent were excellent of their kind, and it will be useless to send any other, that they would obtain premiums, and sell well in England. We suppose the Lower Canada Agricultural Society will not be backward in offering all due encouragement to parties in this part of the Province to prepare articles to be sent to this great English Exhibition, particularly specimens of Agricultural production, from a strictly Agricultural country. We have timothy hay here superior to any hay produced in England for horses. Whatever may be done in this way, a deputation will have to be sent to England with them, to give them any thing like a fair chance. With all their variety of superior agricultural implements in the British Isles, we have never seen a more useful and simple machine, than the Lower Canada hay-cart. It is easy to manage, drawn by one horse, and according to our humble judgment, is suitable for every country, and in ordinary circumstances, would be preferable to all other carts or waggons for drawing hay or grain to the barn or stack yard. Large heavy waggons or carts, are not convenient, or suitable for most farms; they might answer very well, on good roads, and where the distance was great, that hay or grain had to be carried; but the Canadian hay-cart, for the general purposes of carrying the harvest home cannot be excelled in this or any other country. We shall take time to think of some other good things we have here, and we hope to make out a list that should be creditable to Canada. There is another article here, than which there cannot be any thing employed in the same way, that is more convenient; we allude to the Canadian truck, made use of in our cities,

drawn by one horse. These are easily loaded and unloaded, and drawn by a good Canadian horse, cannot be exceeded, on this continent, or in any other country. The great advantage of both hay-cart and truck, is their simplicity, cheapness, easy management, and efficiency compared with the cumbrous waggons, and the sort of carts they make use of in the neighbouring States, and in England. These two articles are very material items in the implements of a country, and we take upon us to say, they are not excelled, *nor equalled*, to our knowledge, for their several uses. We have some agricultural implements made here by Mr. Fleck, and implements for cleaning grain and seeds, made by Mr. Rice, equal to those of any country. We have also Thrashing Mills made by Mr. Paradis and others.

If, however, the Provincial Agricultural Societies of Upper and Lower Canada propose to take part in the great English Exhibition of the industry of all nations, they will have to do something more than offer a few small premiums for articles to be sent to England by their owners. At all events, unless there was a direct appropriation by the Legislature to assist the Societies to forward Canadian products to the great Exhibition, they can employ their other funds fully as advantageously for Canadian Agriculture by the establishment of Model Farms and Agricultural Schools in Canada. We might send products that would be creditable to us certainly, but to send them as they should be sent, would require some expenditure that our Agricultural Societies could not well spare from their present means, without neglecting the due encouragement of improvement at home. There is abundant work to be done in Canada by the Provincial Agricultural Societies.

AGRICULTURAL ASSOCIATION OF UPPER CANADA.

The Annual Meeting of the Directors and Members of this Society took place in the Court House, in this city, on the 20th and 21st instant.

In the unavoidable absence of the President, John Wetenhall, Esq., the Chair was taken by the 2nd Vice President, Thomas Clark Street, Esq., of Niagara Falls.

It was determined to hold the next Exhibition during the third week in September, at the Town of Niagara;—the inhabitants have promised to contribute £300 towards the funds of the Society. Much business of routine was gone through, and some important amendments of the Constitution, in the shape of a bye-law, were passed;—the materials having been supplied by the President, and J. B. Marks, Esq., of Kingston. A Committee was appointed to draft amended bills for the Provincial Association, and the other Agricultural Societies in the Province. It was likewise determined to address both branches of the Legislature, on the importance of establishing a Chair of Agriculture in the University; a Board of Agriculture, and an Experimental Farm. The Prize List was revised;—an additional premiums given both to Durham and Grade Cattle, and also to heavy draught Horses. The grand Exhibition of the industry of nations that is to be held in England next year was then considered, and a strong desire expressed that the honor and the interest of Canada require that our characteristic productions should be liberally represented in the metropolis of the Empire. The following Premiums were then agreed to in reference to this object:—

For the best set of Drawing Room Furniture, made of black walnut, diploma and £15,—second best, £10. For a set made of curl maple,—the same. Broadcloth, not less than ten yards, diploma and £5; second, £3. Blankets, the same. Tweed Cloth, diploma and £3; second, £2. The premiums on these articles to be paid upon the exhibitors giving a guarantee that they send them to England. For the second best 25 bushels of Wheat in the Canada Company's class, £12 10s;—the first prize being £25, offered, as heretofore, by the liberality of the Canada Company. Best manufactured and most neatly put up barrel of Flour, £3; second, £2. Cheese, first, £4; second, £3; third, £2. The same prizes for Butter, in firkins, not less than 56 lbs each. Other Canadian productions, not enumerated above, if of a character entitling them to be sent home, will, no doubt, receive liberal encouragement from the Society. Every effort should be made, and not a moment lost, by the people of this, the most important Colony of the Empire, to reach and sustain an honourable position among the innumerable products of the world's ingenuity and industry, that will be collected together in dear old Fatherland.

We notice, in conclusion, that the meeting appointed E. W. Thomson and Henry Ruttan, Esquires, as Judges for awarding the Governor General's prize of £50, for the best Essay on the bearings of Canals on the interests of Cana-

dian Agriculture. The other Judge, selected by His Excellency, we understand, is John Young, Esq., of Montreal. We hear that ten Essays have been sent in. The Prize List for the next Exhibition will shortly issue.—*British Colonist*.

CORRESPONDENCE.

MR. A. FLECK'S SUBSOIL GRUBBER.

ORMSTOWN, 15th March, 1850.

DEAR SIR,—I promised when I purchased the Subsoil Grubber from you, that I would send you a statement of its performance, as soon as I had finally tested it. You know that farmers are more ready to use an implement, and put its merits to a practical test, than to write essays; but I have been so fully satisfied with the experiments I have made, and with the value of the Grubber, as an implement so essential to the proper cultivation of the soil in a climate like ours, that I feel I would not only fail in my promise to you, but also in my duty to my brother Agriculturists generally, if I did not send you a statement, embodying the result of my experiments, and also of my opinion as to its uses and adaptation. I have used the Grubber for many of the purposes to which it may be applied—in all of which I have found it an implement highly worthy of the attention of Agriculturists. In spring, upon land which has been ploughed in the fall for summer fallow, and for tearing up and destroying twitch-grass, it has fully exceeded my expectation; it can be used much earlier than the common plough, opens the soil to a much greater depth, will do the work of six ordinary ploughs, and leaves the soil so fine as to save an immense quantity of labour in harrowing for summer fallowing and subsoiling. I find it the most valuable implement yet brought into use in Canada. Indeed I think that no farm is complete without a Grubber, which, where cultivation is carried on on a large scale, will pay itself in one season, by the saving it will effect in the labour, to say nothing of the superior preparation of the soil. Two horses are sufficient to

work the Grubber, except where there is a very stiff clay soil, it may be necessary to put on a third one.

I am, dear sir, your obedient servant,

GEORGE CROSS.

To Mr. Alexander Fleck,

St. Peter Street, Montreal.

ORMSTOWN, 15th March, 1850.

SIR,—It is due to you and to farmers generally, that I should add my testimony to what my friend, Mr. Cross, has said about your Subsoil Grubber. I borrowed the implement from him, and was, I confess, rather doubtful of its performance. But my doubts soon gave way. I used it for a day and a half last spring, upon land that had been ploughed the fall previous, and only used two horses, and did as much work in that time as I could have done in eight days with the common plough. And I also found the saving it effected in subsequent harrowing, even more than what I have stated in the use of the plough. The Grubber, I conceive, is calculated in a very high degree to compensate for the shortness of our season, by doing a great deal of work in a very short time—and doing it much better than the old method. I have no doubt, that as soon as the importance of the Grubber is known, every farmer who can afford it will have one.

I have the honor to be,

Your obedient servant,

ALEX. YOUNIE.

To Mr. Alexander Fleck,

St. Peter Street, Montreal.

To the Editor of the AGRICULTURAL JOURNAL.

SIR,—By your number of last month, I observe with pleasure that the Lower Canada Agricultural Society have determined that the Agricultural Journal shall make its appearance during the present year; and hope that this timely hint will not be unheeded by our farmers; and that, moreover, the Legislature will find it its bounden duty to come forward to its support.

I am also highly gratified to see Mr. Fleck's "Farming Implements" so deservedly noticed. I spent a few days in Montreal last summer, and, with a scrutinizing eye (excuse my presumption) examined his samples of manufactured implements, which, I concluded, could not be excelled by the manufactures of any country; I will be obliged if, in your next number you insert the notice on Mr. Fleck's "Farming Implements," you will add my name to those already appended to the certificate of their excellence and superiority.

I would strenuously urge, and respectfully suggest to the several Agricultural Societies of the District of Quebec, and especially to the "District Societies," the expediency and wisdom of making a large purchase annually, of Mr. Fleck's Farming Implements, for distribution at the Exhibitions as prizes, in lieu of money: this would be a most efficient mode of introducing the use of good and suitable implements of husbandry in a district where these are too generally, very defective.

If you judge the foregoing remarks and suggestions worthy of insertion in your Journal, I shall feel both proud and grateful, and remain respectfully,

Sir,

Your most obedient servant,

MATTHEW DAVIDSON.

County of Quebec, 23rd February, 1850.

To the Editor of the AGRICULTURAL JOURNAL.

SIR,—Will you be so good as to reply to the following queries, on the subject of the employment of manure?—

1. Will manure gathered or made in winter be more profitable if left to heat for some weeks; or whether should it be used at once in its natural state?

2. Some farmers in this part of the country have put lime on the manure to destroy the seeds of bad weeds, &c. Do you approve of this proceeding? Does it not injure the manure, and impoverish it?

3. Would it be more advantageous to the farmer to preserve in a heap for for one year or two, the manure made or gathered this year, or ought it to be put without delay upon the fields?

4. The manure gathered this winter, is it more profitably applied on the meadows, than to plough it into the soil? For the meadows or for the tillage

crops, would it be more advantageous to employ old manure?

RUSTICUS.

County of Berthier, 26th February, 1850.

We reply with pleasure to the "Queries" put to us above, by our respected correspondent, "Rusticus."

1st. We believe that for ordinary purposes upon the farm, manure should be made use of the same year that it is made, and when in a state of fermentation is the best time to apply it to the land and crops. This fermentation should not be allowed to proceed too far, before the manure is put into the soil. We have been in the habit of removing all the manure we could during the winter from the farm-yard to the fields, where it would be required in the spring—and we have always found it in a suitable state of fermentation at the time it was required to be made use of in spring. The remains of straw and scattered manure in the yard, at the breaking of the winter, we had collected in a heap in the yard, and we found that in the course of a month or six weeks this heap was in a very good state of fermentation to be employed in the field. In general, Canadian farmers do not have much straw in the farm-yard, nor is their manure much mixed with straw. It is consequently fit to be immediately employed in the field, and should never be kept over to the second year. Any manure will produce more benefit to the soil and crops applied the year it is made than it will after keeping to a second year. Manure overheated, before it is applied to crops, loses a large portion of its most valuable qualities.

2nd. Seeds of weeds in manure are very bad, and it would certainly be well to destroy their vitality by allowing the manure to ferment to the necessary extent for that purpose, but lime should never be applied to farm-yard manure unless when mixed in a compost heap. In that case, alternate layers of earth, manure, lime, &c., may be placed together, mixing the

lime as much as possible with the earth or moss, when making the heap. All these layers, after remaining some weeks in this state, should be mixed up together, and the more frequently the heap is turned over and mixed before it is made use of the better.

3rd. The replies given to the two first "Queries" may be sufficient for this also.

4th. As top-dressing for meadows, where there is old manure, it is generally applied; but if manure is harrowed in with grain crops, we should prefer making use of old manure for this purpose when we had it, to top-dressing meadows with it. Recent or fresh manure will answer well for top-dressing meadows, although compost might do better. There is considerable objection to the use of fresh manure as top-dressing for grain crops, as if there be any seeds of weeds in it, they are sure to grow rapidly, if their vitality is not destroyed. Fresh manure will answer much better for grain crops if ploughed in, than harrowed on the surface. Indeed we should almost prefer allowing grain crops to be without manure, to top-dressing them with any that had not been previously well fermented. For root or hoed crops, it is not of so much consequence that fresh manure should be made use of, as the after cultivation should keep down all weeds. In all cases farmers should remember, that manure cannot increase or gain anything by long keeping, but, on the contrary, will be always losing. Therefore, the sooner it can be put into the soil, and applied to the crops, or mixed in compost, the better it will be, and the greater the production.

ENGLISH BREEDS OF NEAT CATTLE.

In England a country abounding with luxuriant pasturage the ox, only used for the purposes of Agricultural labour in a few limited districts, is destined to benefit the grazier on the one hand, and the dairy farmer on the other; with the grazier roundness of form, a moderate smallness of bone, depth of chest, and an aptitude to acquire external fat upon a small consumption of food, are among the points of excellence aimed at and expected. The attainment of perfection, however, in the points most desirable in the eyes of the grazier is gene-

rally accompanied by a corresponding deterioration of cattle, in those qualities connected with the interest of the dairy farmer, for very seldom are combined an aptitude to fatten and the quality (in the cow) of yielding an abundance of rich milk. Both parties therefore attend to their peculiar interests, agreeing only in the care bestowed upon the animals subservient to their respective purposes.

Among the older breeds of cattle, but now greatly modified, was a long horned race of which the west riding of Yorkshire and Lancashire were the central residence, whence it extended through the midland counties and into Ireland. This breed was termed the Craven, from a district of the same name in Yorkshire bordering upon Lancashire, where it is said originally to have appeared.

In the beginning of the eighteenth century various agriculturists commenced a series of attempts towards the improvement of this old but ever valuable breed: and to the skill and judgment of Mr. Bakewell is to be attributed, the Dishley or New Lancashire Longhorn breed; in this breed the form and tendency to acquire fat were greatly improved, and the size of the bone reduced. To the grazier the improvement in these points was of the highest value, but the dairy man preferred the old stock. In process of time, however, the new breed extended, improving the cattle of the midland and northern counties, and especially of Ireland. Every where, however, the long-horned has of late years yielded to a middle or short-horned race: and even in Liecestershire the stronghold of the Dishley breed, few are now to be seen. In Cheshire, also, which till recently retained a long-horned breed derived chiefly from the old Lancashire and New Dishley stocks, the Durham or short-horned race has made decided inroads, but with doubtful advantage as respects the quality of the cheese for which that county is celebrated. Among the long-horns may be reckoned the old Shropshire breed, a large boned and hardy race, and well fitted for the dairy. This breed is now seldom seen pure, having been crossed with advantage by the short-horned Holderness. Though the short-horns have superseded the long horns in most parts of Staffordshire, the latter still continue to maintain their ground in the north of that county, and more particularly along the banks of the Don and Trent, close to the borders of Derbyshire.

The Devonshire breed is of great antiquity, and has been long celebrated for beauty; like most of our other breeds it has within the last fifty or sixty years become improved and has perhaps now attained to its perfection.

The head of the Devon ox is small but broad across the forehead, and narrow at the muzzle: the horns have a graceful curve upwards: the

chest is deep and the back straight, the cow is small compared with the bull.

The system of ploughing with oxen is very generally practised in Devonshire, and where the land is not too heavy no teams of oxen are superior, if equal to these in this kind of work. Four good oxen are equal to three horses, and will go through as much labour on the road or in the field in as short a time.

To the grazier this breed is of great importance, few oxen rivalling the Devonshire in disposition to fatten and in the quality of the flesh. For the dairy, however, this breed is inferior to many as respects quantity of milk, but not quality, for it yields more than an average proportion of cream and butter. Some farmers, however, have found the North Devons to yield a large produce of milk: contrary to the common opinion, much probably depends upon pasture. In Somersetshire the Devon breed prevails, or at least the original breed has been greatly crossed by the Devon, of which it presents most of the excellencies. The Somersetshire cattle are valuable for: "the pail, the plough, and grazing." The tract of country between Bridgewater and Cross produces cheese of well known excellence; the best Cheddar cheese is made either in that tract or in the marshes round Gladstonbury. The Hereford improved breed with white faces, is valuable as fattening rapidly, and that on inferior fare: the flesh is fine-grained and highly prized in the market; the cows, however, yield but little milk; indeed a dairy of Hereford cattle is seldom to be found. In Gloucestershire the Herefords are preferred for the team, and by graziers for fattening, but the true Gloucester breed for milk. The Gloucester breed is of mixed origin, composed of an old race of Welsh descent, as is supposed, and of various others, and among them the Alderney. The rich vale of Berkeley produces the finest Gloucester cheese.

Alderney cattle are imported here from Normandy and the islands on the French coast, from one of which (Alderney) they take their name. These cattle are small, and often awkwardly shaped, every point being more or less defective: still they are favourites, the cows yielding milk, if not in great quantity, yet of peculiar richness and abounding with butter. Improbable as it might seem from the appearance of the Alderney, its aptitude to fatten is remarkable; the cows when dried, speedily become fat, and sometimes acquire considerable weight. Still with the exception of Hampshire, these cattle are not kept in any county on an extensive scale; it is in the pleasure grounds of the gentleman that they are chiefly to be seen. In Hampshire, however, they are very general. Mr. Gauler states that the stock best adapted to the soil of that county are the Alderney and the smaller races of Normandy cows. The Devonshire and

larger breeds require richer pasture: and although they may be kept in condition the milk they give is by no means in proportion to the bulk of food they consume. Mr. Gauler's dairy stock was in the proportion of one cow of the Devonshire breed to three of the Alderney and Normandy, and the milk was mixed on the presumption that being thus diluted it produced better butter and a larger quantity of it.

Improvers of Agriculture.—It is curious that many to whom improvements in agriculture are traced were not professional farmers, but men engaged in other pursuits, who, with cultivated minds turned their attention also to the subject. Thus the first English treatise on husbandry was written by Sir A. Fitzherbert, judge of the common pleas, in 1534, and from this Harte, canon of Windsor, in his *Essays on Agriculture*, dates the revival of agriculture in England. Tusser, the author of "*Five Hundred Points of Husbandry*," published in 1562, was a scholar of Eaton, and afterwards of Trinity Hall, Cambridge. Before he applied himself to farming and literature, Sir R. Weston, who was ambassador from England to the Elector Palatine and King of Bohemia in 1619, introduced clover into England; his discourse on the husbandry of Brabant and Flanders was published in 1645, and is said to mark the dawn of the vast improvements which have since been effected in Britain; Evelyn who is considered one of the greatest encouragers of improvements that has ever appeared, was, as is well known, a gentleman attached to literature and science, and often employed in the public service. He published, in 1664, his *Sylva*, or a discourse on Forest Trees and the Propagation of Timber in His Majesty's Dominions, with many other works, which had a great influence in the improvement. Jethro Tull, who introduced the drill husbandry and published his work on Horse-hoeing Husbandry in 1737, was bred a barrister; he first made experiments on his own estate, and then practised farming.—*Boyle on the Productive Resources of India.*

MANUFACTURE OF CHEESE.—No. 1.

IN some parts of the kingdom, the manufacture of cheese is as perfect as if the process were directed by the best rules of science, and performed by hands trained by experience and practice. In other parts the process is in perverse contradiction to the maxims either of science or experience. In various districts the value of the best cheese varies at least thirty per cent. The common prejudice is, that certain districts enjoy natural advantages as to cheese making. This, however, is certainly an error; for here and there in every region there are managers of dairies who make an excellent article, and these carry their art with them into whatsoever district they may migrate. Without

question the quality of the land and the herbage does, in a certain degree, modify the character of the cheese. The same differences also create a necessity for some slight modification of the process of manufacture. How far this difference extends will be enquired as I proceed farther into the subject; but as a general rule, it may be said that the quality of the cheese depends wholly upon the skill and care with which the process of manufacture is conducted. Different kinds of cheeses are made in various districts, and of course each variety requires a modification of process. But whatever kind of cheese is made, its quality depends on certain cautions being observed in the manufacture which are equally necessary for one as another kind of cheese. The defects and the excellencies of every sort of cheese are akin in character, and are produced by similar causes. It is obviously of much importance to establish some general principles of manufacture which may guide dairymen. It is especially important just at this juncture, when the contest between our inferior descriptions of cheese and the produce of America and Holland turns more and more every month to the advantage of our own dairymen. He would perform a most useful work who should assist in every so little a degree in diffusing among the least skilled the rules which are observed by the best makers of cheese. Science is doing and has done much for us; but its results have been for the most part brought about by a more intelligent observation of facts, which experience had already taught practical farmers in some districts. A little while ago, it became expedient to me to search after the best method of cheese making. I enquired of neighbours, some of whom were successful, and others unsuccessful makers of cheese. What one told me was right, another said was wrong; and sometimes I was advised to provide against a defect by the very means which another told me would produce it. I looked with some diligence into books; but here I found similar discrepancies, and I gathered a deal of information without attaining much knowledge; I found everything except just what I wanted to know, namely, how to guard against the several defects which appeared in the cheese manufactured in my own district. I then began to make enquiries in parts of the kingdom distant from my own locality as well as near to it, and found every body very willing to render me an account of his mode of manufacture, and the peculiar character of the cheese. From these enquiries I soon saw very abundant reason to attribute certain defects to causes I had not recognised before. One defect was scarce ever found in one district, and there I noted a difference in the process, and so in other districts. Afterwards, on turning to our own neighbourhood, I was able to discover that

in the dairies where certain defects were common, the process differed exactly as I should have inferred from what I had learned farther abroad. I am induced, therefore, to believe that it may serve at least to guide the enquiries of others, if I set down plainly the results I have arrived at. I need not perhaps take much pains to caution any one against accepting too implicitly such opinions as I offer; one is not apt to receive too much confidence from practical men. But deductions from empirical practice can never be held quite trustworthy until they have been confirmed by special experiments directed to the solution of each special question. It is to be hoped that the process of cheese-making may receive a portion of the attention of both scientific men and practical farmers; for hitherto it has been much neglected by both.

What I have to offer on practical points, requires that I should, in the first place, shortly state the properties of the composition of milk, and the rationale of the process of cheese making. There is perhaps a good deal which is rather obscure to scientific chemists in the process; and as I am not even a chemist, I may omit to state something material, as well as shew myself ignorant of some of the latest and subtlest results of scientific investigation.

The analysis of milk by various chemists shows that its composition varies considerably as to the portion of its ingredients. It contains curd or casein, butter, sugar, and several kinds of saline matter. The curd, butter, or the sugar, are each sometimes more abundant than the other two. In the earlier period after calving, the cow yields milk very rich in casein; later the sugar or the butter may predominate; and the description of food, as well as the habit of the beast, makes much difference in respect of the proportion of each of these ingredients. We may assume that the three are on an average equal in quantity though the assumption is not quite in accordance with the actual fact. If we do so assume their proportion, then we may further assume their whole quantity to be about twelve per cent. of the weight of the milk. A gallon of milk weighs rather more than ten pounds, therefore ten gallons will contain about four pounds of curd and four of butter, and as cheese when made contains from twenty-five to thirty-five per cent of water, almost one pound weight of cheese curd would on this calculation be yielded by a gallon of milk—a quantity which is nearly the average yield in the actual practice of cheese-making. The average quantity of saline ingredients in milk may be stated at one two-hundredth part of the milk's weight. These ingredients are phosphates of magnesia, lime, and iron, chlorides of potassium and sodium, and a portion of free soda; which last is of most importance in solution, to the process of cheesemaking.

The soda may be taken as one-twelfth part of the weight of the whole mineral ingredients of twenty gallons of milk, therefore, which weigh two hundred pounds, and yield one pound of ashes, will contain one and a quarter ounce of free soda. The curd is held in solution in the whey by means of this small portion of free soda. The butter is merely suspended in the milk, and exists in the form of minute globules enclosed in a pellicle.

When milk turns sour, and the air is above a certain degree of temperature, the curd coagulates, and the coagulum is more or less firm as the air varies in its degree of heat. The souring of the milk is caused by the conversion of a part of the sugar of the milk into an acid called lactic. This acid neutralises the free soda which holds the curd in suspension. The butter of milk, as we know, rises to the surface when the milk is suffered to stand; but until released from the envelopment in which each particle is wrapped, it is in the form of a creamy substance. A little beating of the cream at the higher temperature, or churning it at a lower, separates the butter. It is material to bear in mind that a certain degree of warmth does separate the butter from its envelope. The process of cheesemaking begins by inducing an immediate souring of the milk. This may be done by several agents; but we need only mention rennet. When a portion of rennet is added to milk, the conversion of the sugar into lactic acid almost immediately begins; and just as happens when milk sours in warm weather, a coagulum is formed which is firmer in proportion as the heat of the milk is high. It may be as well to state the mode in which rennet is supposed to produce this effect; because, as we see, on the right adjudgment of the quantity of the rennet and the temperature of the milk, depends the first *sine qua non* of the felicitous issue of the whole process of cheesemaking. Rennets, as well known, are much improved in strength by being kept a considerable time. It is supposed that the animal matter of the rennet-skin exists in a certain state of decomposition, and that when brought in contact with the casein of the milk, it induces in it a similar change to that which itself is undergoing. Side by side with this change in the casein goes on the conversion of the sugar of the milk into lactic acid. We do not understand how the rennet operates to induce these changes; all we know is that they do take place. But there are abundant instances familiar to us of similar effects produced in substances by other agents. For instance a small portion of yeast is added to a wort, and straightway it causes the gluten to change into yeast, while the sugar is changed into spirit and carbonic acid. A small particle of putrifying matter, too, induces putrefaction in any animal substance. But that

which it is chiefly to our purpose to remark is, that each degree of temperature, within certain limits, gives greater activity to the operation of these agents, and modifies the products they engender; and that a larger quantity of them also renders the change more active. Every one knows how easily a high temperature of the air gives to butter its strong rank flavour; and it is easy to conceive how too much rennet at a high temperature may induce changes in the casein and the butter which cause the cheese to be strong. When we consider, too, that the quantity of free soda may vary greatly, we can conceive, that as the rennet will necessarily be required to change a greater portion of the sugar into lactic acid, in order to neutralize an excessive quantity, there will be a difference in cheese made from pastures or food, which cause the milk to contain an abundance of free soda.

After stating the properties of a good cheese, and the common defect of bad, I will proceed to the practical part of cheesemaking, and in each step of the process will enquire into the cause of the particular defect, which arises from its being conducted faultily. Whether in a Stilton, a Cheshire, Gloucester, Leicestershire, or Cheddar cheese, we require first that it should be free from rankness and mawkish taint. The texture too in all should be close and free from holes, but also tender, unctuous, and mealy. Of the faults in flavour or in texture the following seem to be the most prominent and most common:—

The cheese may be strong, what in my part of the country is usually called, "tasting of the rennet." I imagine this fault is really due to the mismanagement of the rennet. Too large a quantity and too high a heat tend to produce it. Its immediate cause I take to be certain changes in the butter of the cheese, like those which occur when butter goes rancid, and which consist in the conversion of a portion of the butter into cuprois and other fetid rank acids. The cheese may have a mawkish, tainted flavour and taste. This fault I believe is due to the occurrence of a degree of putrefaction, which commonly is the result of uncleanness of the utensils, or from exposure to air and imperfect salting in warm weather. The cheese may heave, in which case there is frequently a tainted taste of the middle portion of it. The heaving is caused by the fermentation of the whey, and the consequent generation of gasses which swell the substance of the cheese, and fill it with crevices and holes. This fermentation is, I conceive, vinous: the sugar of the whey is converted into alcohol and carbonic acid, which latter not finding an escape, swells the substance of the cheese. We know quite well what engenders and what prevents vinous fermentation; and therefore we cannot be in much doubt as to

the causes of the remedies for this kind of defect in cheese. These I will notice when speaking of that part of the process which determines the quality of cheese in this respect. A close toughness of texture is caused by too high a temperature of the milk, when the rennet is mingled with it. To the same cause is also due the little holes which are scattered through tough cheese, and which are filled with whey; the toughness does not permit the whey to exude, though it makes its separation from the curd more entire. Too soft and pulpy a texture is caused by too low a temperature of the milk. Of the particular flavour and texture of a sour cheese, I need not say more than that they are familiarly known to all, and their cause and its remedy obvious. There are other faults, but it is scarcely material to notice them, because any plan of manufacture which obviates the greater will also obviate the less marked defects. In my enquiries I gained a knowledge of the method of making most kinds of cheese, from the rich Stilton down to the skim-milk quality of each dairy district. But it will be better if I confine myself to the making of cheese from milk without the addition or subtraction of any portion of cream.

The first question which presents itself is whether it be preferred to employ new milk fresh from the cow, or to allow the whole or a portion of the whole to stand over one or more meals. In some parts of the country one plan is pursued, and in some another; but as in those districts which send forth the best article the general practice of dairymen is to mingle old and new milk, we might be justified in the presumption that the practice is the best of using mixed milk. In the best dairies of Leicestershire they use new milk; and therefore we may be assured that both plans are good when well conducted. Perhaps as in the case of governments, "what's best administered is best." Still the difference in quality between the best Leicester and the best Cheshire is sufficiently in favour of the latter to make it worth while to enquire wherein there is an advantage or otherwise in using mingled milk. In Cheshire they adopt no other caution in keeping the milk over one or two meals than placing it in pans in an underground cellar. They thus prevent its souring. But some people allow the pans of milk to stand in a shallow cooler which is constantly supplied with cold water from a well, and the pans being covered the milk is kept at a temperature but little above fifty-two. In answer to questions as to the effect of using old milk, the unanimous answer of good makers is that the cheese is richer and more mellow. Some difference of opinion exists as to the precise mode in which the rennet acts on new or on old milk. But I have generally been told that less rennet is required

for a given quantity of mixed milk than of new; and also that a good curd may be attained at rather less temperature. I believe that both opinions are correct, but I have generally been told that less rennet is required for a given quantity of mixed milk than of new; and also that a good curd may be attained at rather less temperature. I believe that both opinions are correct, but I have not verified them by experiments accurate enough to be relied on. One can easily conceive that exposure to the air may have some chemical effect on the casein of the milk. The change made on the casein by the oxygen of the air may dispose it to receive more readily the action of the rennet. It may also cause the curd to have a slightly altered texture; for we know that souring produces such a change as makes the curd quite obscure the taste of the butter in the cheese, and we can therefore conceive that its oxidation may cause the curd to have such a texture as allows the richness of the butter to be more prominent. In the dairies of Leicestershire and Derbyshire the greatest difficulty is experienced on some pastures in preventing the cheese from heaving. They adopt several expedients to prevent the fault, and one of them is the laying aside a portion of the milk and taking from it a part of the butter. The notion is that the over-richness of the milk in the butter disposes the cheese to heave. I do not see, however, how the butter can have any such effect; on the contrary I imagine that an excess of butter would have quite the opposite effect. It seems to be more likely that the exposure of the milk and not the removal of the butter is the real cause of heaving being prevented—if indeed it be prevented—by this means. In Cheshire it is seldom that heaving is complained of in the best dairies; and there the fault is always attributed to an imperfect extraction of the whey. But one fact is clear, namely, that a cheese made from skim-milk very seldom heaves; and when it is at all soured never.

The temperature of the milk when the rennet is added is no doubt one of the most important points to be attended to. When we see that not one in five hundred dairymen make constant use of thermometer one need not wonder at the frequent derangements that occur in the best dairies. A person cannot tell within twenty degrees of what temperature a liquid is by placing the hand in it. Take the hand out of cold water and then put it in milk of 70 degrees and it will feel quite warm; first place the hand in water heated to 100 degrees, and that at 70 will feel quite cold. Now milk, which is of the temperature of 93, as it comes from the cow, will lose several degrees in being carried to the cheese pan in cold, and will lose little in hot weather. Nothing certain therefore can be known about the temperature without the ther-

mometer when even old and new milk are used. But when old and new milk are used, and the former requires warming, very great mistakes must often happen.

ON DRAINING AND THOROUGH LOOSENING OF RETENTIVE CLAY SOIL.

To the Editor of the North British Agriculturist.

Sir,—As the season best suited for marking out and forming drains is now approaching, viz., spring and summer: the land springs and stagnant hollows, on account of the accumulation of water during winter, are more easily found out. Allow me to draw the attention of those of your readers concerned, to this most important first step to successful agriculture.

It may be thought going too far to insinuate, that every description of land, whether wet or otherwise, should be thoroughly drained; although there is little doubt but advantage might be derived from this operation by admitting the air more freely into the interior of the active soil. Underground climate is as necessary to the well-being of a plant as terrestrial climate. Although the roots of a plant burrow below the surface of the ground, they are not, on that account, insensible to the influence of the air. Both extremities of the plant feed upon the air, and the roots are said to do so more than the leaves. Place a plant in an exhausted receiver, the leaves soon drop off, to be followed by the decay of the branches and the stem. Roots, in similar circumstances, will soon shrivel and die. Hence it is, that the admission of air into, and the temperature of the ground, require to be regulated, as well as at the atmosphere that presses above it.

It is well planned and well executed drains, accompanied by the deep breaking up of the soil, that underground climate is improved, more especially in stiff clay land. Until the advantageous effects of thorough drainage became evident, perhaps the subject of underground climate was not so much thought of. Many suppose the great advantages derived from good drainage only consist in the removal of superabundant water, and that air and heat have nothing to do with the active soil. Water of itself is not an evil, it is the food of plants, and its absence is attended with very fatal results. It is the excess of water that proves injurious; and why? because it excludes the air. All the interstices between the particles of the soil being occupied with water, air is necessarily absent except a very small portion contained in water; but remove the superfluous water, then air takes its place, and holds in suspension as much water as necessary for nourishing the roots of the plant, and hence the necessity of not only draining and breaking up strong adhesive clay land, but also, of mixing with it such substances

as will have a tendency to form the many thousands of canals, though which air and water may freely find admission to the roots of the plants. For this purpose, rough stable manure, where bean-haulm has been used as litter, coal ashes, roasted turf, unsound, charred faggots, bottoms of turf, and peat bins, &c., will be found of great service.

Another very important advantage, connected with thorough draining and thorough deep ploughing, is the increase of temperature attendant on these operations. It has been ascertained by those conversant with the advantages of proper drainage, that *drained land in summer is from 10° to 20° warmer than water-logged land*. The gardener is well aware of the great advantage derived from bottom as well as from top heat, being applied to those plants which are natives of a climate warmer than our own, and also the beneficial effects of not only warming the water to be applied to the roots of these plants, but also of covering his vine borders with tree-leaves, or long litter, and of constructing tanks for warm water, and hot beds whereon to grow his melons and cucumbers with any degree of success; and why should not farmers, by proper drainage, endeavour to raise the temperature of the land, so important to the growth of those crops which they cultivate, as scarcely any of these are natives of countries so cold as our own.

Heat cannot be transmitted downwards through water-logged land, but remove the superabundant water, and the heat radiated on the surface of the soil, and air will descend, as well as ascend, and the moisture or particles of water in the soil will be rarified or converted into vapour, the best state in which it can exist as nourishing food for the roots of the plant.*

Evaporation from the surface of water-logged land has a tendency to lower, rather than to raise the temperature of land, in the same way that wet flannel wrapped around a jar of wine or any other liquor, and placed in the sun to evaporate, has a tendency to cool the wine, &c., in the jar.

Seeing, then, that air and water combined with caloric, in the form of vapour, are in a state highly susceptible of being absorbed or sucked up by the spongeoles of the roots of the plants; and that thorough draining, and deep ploughing or trenching are the best means, on a large scale, to be employed in bringing these elements into operation, why not make draining and thorough breaking up of the soil, the first and most essential point in farming?

The Deanston or "Frequent Drain System," which is practised here to a great extent, is justly considered the best, the distance between

the drains being from 15 to 18 feet, and running parallel with the declivity of the land, and discharges from them being carried off by the main drains directed along the bottom, or lower part of the field. Thirty inches or 3 feet, will be sufficient depth, and for main drains 6 inches deeper. The width of these drains will depend upon the materials with which they are to be filled.

The most prominent and best filling is tiles and rough gravel, or small stones, about the size of road metal. The tiles may be either the semicircular of 3 inches diameter, with soles, or pipes of 2½ inches with collars (those having a flat side, are not so ready to sink into the clay), for the "*frequent drains*," over which may be laid 6 inches in rough gravel or small stones. If the stone or gravel is to be dispensed with, from 2 feet to 30 inches, will be depth enough, although there can be no doubt but the additional 6 inches of stones or gravel will make by far the best drain.†

EFFECTS OF LIGHT ON VEGETATION.

To the Horticultural Editor of the Farmers' Gazette.

SIR,—I think it is Sir H. Davy that selected the following story:—"A manufacturer of carmine, who was aware of the superiority of the French colour, went to Lyons for the purpose of improving his process, and bargained with the most celebrated manufacturer in that city, for the acquisition of his secret, for which he was to pay £1,000. He was shown all the process, and saw a beautiful colour produced, but he found not the least difference in the French mode of fabrication and that which had been constantly adopted by himself. He appealed to his instructor, and insisted that he must have concealed something; the man assured him that he had not, and invited him to see the process a second time. He minutely examined the waters and the materials, which were, in every respect, similar to his own, and then, very much surprised, said, 'I have lost my labour and my money, for the air of England does not permit us to make good carmine.—'Stay,' said the Frenchman; 'do not deceive yourself, what kind of weather is it now?' 'A bright sunny day,' replied the Englishman. 'And such are the days,' replied the Frenchman, 'on which I make my colour; were I to attempt to manufacture it on a dark or cloudy day, my results would be the same as yours—let me advise you, my friend, always to make carmine on bright, sunny days.' 'I will,' rejoined the Englishman, 'but I fear I shall make very little in London.'"

A well-known proverb is, "make hay while the sun shines." We are told that philosophers are not agreed as to the peculiar action which light exerts upon vegetation, and there is even

* See Remarks by Dr. Lindley in the *Gardeners' Chronicle* for 1849, p. 35.

some doubt respecting the decomposition of air and water, during the process; one thing is undeniable, the necessity of light to the growth and health of plants, and, accordingly, they are, for the most part, so formed as to receive it at all times when it shines on them. Their cups, and the little assemblages of their leaves before they sprout, are found to be more or less affected by the light, so as to open and receive it. In several kinds of plants, this is more evident than in others; their flowers close entirely at night, and open in the day. Some constantly turn round towards the light, following the sun, as it were, while he makes, or seems to make, his revolution, so that they receive the greatest quantity possible of his rays. Thus, clover in a field follows the apparent course of the sun. But all leaves of plants turn to the sun, place them how you will, light being essential to their thriving.

A few of the effects of light upon vegetation, pointed out to your readers, may be useful to some of them.

We are told that solar rays appear to be the immediate cause of perspiration, which proceeds in proportion to their intensity; yet this action is necessarily modified by the state of the mediums—that is, of the atmosphere which surrounds them, in proportion to its heat and dryness, will their power be augmented, and in proportion to its cold and moisture, diminishes.

The physiological effect of an excessive augmentation of perspiration is, to dry up the juices and to destroy the texture of the leaves; on the other hand, an excessive obstruction of that function, prevents the decomposition and assimilation of the fluids, and the formation of new organized matter, as well as of the secretions peculiar to a species.

We are also taught that it is to the action of leaves, to the decomposition of their carbonic acid and of their water, to the separation of the aqueous particles of the sap, from the solid parts that were dissolved in it, to the disposition thus effected of various earthy and other substances, either introduced into the plants as siliceous and metallic salts, or formed there as the vegetable alkalis, to the extraction of nitrogen, and probably to other causes as yet unknown, that the formation of the peculiar secretions of plants, of whatsoever kind, is owing. And this is brought about principally, if not exclusively, by the agency of light. Their green colour becomes intense in proportion to their exposure to light within certain limits, and feeble in proportion to their removal from it. Also, among the immediate causes of the peculiar changes that occur in the secretions of fruits, are heat and light, without which the peculiar qualities of fruits are imperfectly formed, especially in species that are natives of countries enjoying a high, summer temperature.

It is found that among the effects of a high temperature, and an exposure to bright light is the production of sugar and of certain flavours, and that under opposite circumstances acidity prevails.*

On the importance of light to fruit trees, Mr. Errington very justly remarks: the beneficial influence of a free admission of light to all parts of a fruit tree are mostly admitted in the aggregate, but still not justly appreciated in the detail. It has become quite fashionable during the last twenty years, to talk of the vast influence which this element has over vegetation; yet we still find gardens, the majority, we fear, in which, during the prime of summer, the fruit trees are smothered with young spray, and that, too, at the very period when solar light, acting freely on the leaves of those portions of the tree considered permanent is, indeed, alone beneficial. At the close of the year everybody begins to think of pruning at least as soon as the leaf has fallen, and then, when light is no longer of service, every pains will be taken to remove useless spray and to prepare for another smothering or checking course, which the absence of summer pruning is sure to produce. Now, why is such a course pursued? A niggardly economy, no doubt, will be found to lie at the bottom of the whole affair, as to many persons who having either time or inclination themselves to perform these operations, are yet able to employ a person to do it for them. We have, in our day, repeatedly known a whole garden of trained fruit trees completely spoiled, as to the prospect of well-organized buds for the ensuing crop, or of a fruitful habit in ensuing years, though a fortnight neglected during the months of June or July.

Many field crops are also greatly injured by one part over seeding the other.—Yours, &c.,
PETER MACKENZIE, *West Plain-Stirling, Feb. 12, 1850.*

GREAT VALUE OF WINTER TILTH.

Practical men have been long acquainted with the value of the pulverization of the soil that is affected by the vicissitudes of the weather during the currency of the winter. The water in the soil is alternately expanded and contracted by the frosts and thaws, and the earthy particles are severed and pulverized in a very minute manner, which no artificial cultivation is able to approach. Being dried by the winds and sun of the spring, this pulverization forms the "March dust," which is so much prized by farmers, and is the nearest possible resemblance to the alluvium of nature, in which plants so very much delight to dwell and grow. It is most peculiarly grateful to small seeds, as clo-

*Theory of Horticulture.

vers and turnips, and, in fact, is essential to their prosperity.

My attention was very forcibly called to the truth of the above fact during a visit of last year to the Royal Farms at Windsor. The soil of these farms may be called a loamy stiff land, varying from clay soil to the turnip loam. A field on the Flemish farm, a stiff green crop loam, had carried a crop of swedes and beet-root, which was removed from the land in the early winter, and a part of the field was ploughed into ridges, in preparation to be sown with barley. The other part was ploughed in the spring month of barley sowing. Grass seeds were sown over the whole field in the usual way and quantity, which produced a heavy luxuriant crop on the winter-ploughed part of the field, while very few plants appeared on the part that was ploughed in the spring. The treatment of the whole field was every way the same. The grass seeds came from the same seed-shop, and were used in the very same quantity. This quantity was very kindly pointed out to me by Major-General Wernys, who manages the royal farms, and who is most particularly observant of and cognisant with the facts of enlightened agriculture, as they are found to proceed from the systematised experience of the art.

All lands which possess any part of clay should be ploughed in early winter, and even light lands are much benefited thereby.

ARATOR.

August, 29, 1849.

TO DRIVE AWAY RATS.

To the Editor of the *Sussex Agricultural Express*.

SIR,—Seeing a useful article on the destruction of rats in your last week's *Express*, I beg to forward you the following plan, which I think your readers may find useful:—A short time since I was told by a friend of a most effectual remedy. An acquaintance of his, a farmer, was so alarmingly beset by these destructive marauders, whose name was legion, that the usual aids of dogs, cats, ferrets, traps, &c., were unavailing; he was fairly put to his wit's end. He at length bethought him—lucky thought—that the most effectual way of dispersing an unmanageable mod of enemies of whatever kind, was to call in the aid of the red coats; so the next rat caught in a trap he enlisted or impressed into his service, had him *nolens volens* clothed securely in scarlet, and then let him loose; away he madly galloped, and dashed into the midst of the enemy—consternation seized upon the whole host *instantly*—the panic became general—helter skelter they went—he screaming and they too; the harder they ran the more he strove to keep up with them, so that at last it became every one for himself, and a certain personage

take the hindmost;” “in less than no time,” or four-and-twenty hours, not an enemy was to be seen.

HELP YOURSELF.—Beg, borrow, seek office, fish for place, trust in patronage, wait for old men to die, worship fortune—who does not one or another of these? Who does not expect to rise by the help of others? Help yourself and God will help you. Nine-tenths of the world live and die infidels to this truth. So destitute are most people of the knowledge or belief of this truth, that give them the slightest indications that they may rely on you, eat you, clothe themselves out of you, and they will do it without mercy. They will drop their tools and their labor, and do it. This it is that makes the world so hedge-hoggyish. The self-helpers know that, in the common run, if they know others, they may help and be—eaten up. This it is that spoiled most, if not at all, the experiments to apply the science and economies of association to practical human life. Take people as they rise, and put them together in a bee-hive community, and half of them will turn drones and live upon the rest, because they have not been educated to rely upon themselves, but just the reverse. No wonder that the swarm should be eaten up by these drones, or exhaust itself in an effort to turn them out. Yet men are naturally self-reliant. The moment a baby can go alone, it goes itself and imitates all kinds of work, proud to be doing something. But this disposition is not encouraged, but discouraged. The rich are ashamed to have their children do anything menial, as if menial and mean were the same word. The poor cannot be bothered to teach work to babies, and when their babies get to be old enough, they overload them with it untaught. Hence, the child comes to maturity educated to sloth, “bad health,” and reliance on others, or to hate the burden which crushes him, and longs to be relieved entirely from it. Self-reliance is destroyed every way, in work, thought, and opinion; whole classes, we say races, of men, are taught to feed upon others, without returning any fair equivalent. They even think themselves generous to leave a little which they do not eat.—*Chronotype*.

CULTIVATE ENERGY.—Many of the evils, the want of vigour, the inaction of system, the languor and hysterical affections which are so prevalent among the delicate young women of the present day, may be traced to a want of well-trained mental power, and well-exercised self-control, and to an absence of fixed habits of employment. Real cultivation of the intellect, earnest exercise of the moral powers, the enlargement of the mind, by the acquirement of knowledge, and the strengthening of its

capabilities for effort, the firmness for endurance of evils, and for energy in combating such as may be overcome, are the ends which education has to attain; weakness, if met by indulgence, will not only remain weakness, but becomes infirmity. The power of the mind over the body is immense. Let that power be called forth: let it be trained and exercised, and vigour, both of mind and body, will be the result. There is a homely, unpolished saying, that "it is better to wear out than to rust out;" but it tells a plain truth, rust consumes faster than use. Better—a million times better—to work hard, even to the shortening of existence, than to sleep and eat away that precious gift of life, giving no other recognizance of its possession. By work, or industry, of whatever kind it may be, we give a practical acknowledgment of the value of life, and of its high intentions, of its manifold duties. Earnest, active industry is a living hymn of praise—a never-failing source of happiness; it is obedience, for it is God's great law of moral existence.

BRUSSELS SPROUTS.

This may be called the most delicious of the cabbage tribe, and perhaps on table the handsomest. It is a tall plant, and the habit is to shoot out small sprouts the whole length of the stem; these sprouts form small cabbages—cabbages in miniature, as it were, perfectly hearted at the size of a walnut; these are gathered and cooked without disturbing the shape, and they eat tender and far milder than any of the family. The seed is sown in March, April, or May, or in all three months. The young plants require to be thinned out, or drawn out, and those which are drawn out may be pricked into a bed three or four inches apart all over, and be left to grow into strength until they are ready to plant out, and there is ground ready to receive them. These plants, as they grow, do not occupy much ground in breadth, because they are not spreading; they may be one foot apart in a row, and the rows eighteen inches apart; and they may be put out after a good shower of rain, or the ground must be well watered all over before you plant, as they ought not to receive a check on their planting out. These require earthing up as much as anything, but they should be well established and growing before it is done, and a dry day should be selected for the work. The keeping them clear from weeds, and occasionally stirring the earth between them, comprises all they want afterwards; and when they have grown to their height, and the sprouts begin to move, the tops should be taken off and eaten, as it hastens the perfecting of the sprouts, which may be pulled off when they are the size of a good walnut, and should be boiled whole. They are perfect little cabbages, dif-

fering in no respect but size from cabbages in general. In gathering they require to be gone over a number of times, because none of the buds should be taken off until they are large enough, and four or five pickings will hardly clear them, as they continue sprouting for a considerable time. The seed of this green can never be depended on unless imported.—*Horticultural Magazine.*

LIME AND SALT.

To the Editor of the Mark Lane Express.

Sir,—The direction given in your last for mixing these articles is imperfect. When thus heaped together dry, they do not act upon each other, and might just as well be strewed separately. They should be made damp—not pasty, but heavy, crumbly, and free from dust (like a mellow arable soil), and intimately mixed, not left in layers.

They may be laid down according to Mr. Hillyard's direction, but watering each layer of salt as it is put on, and mixing all intimately together, the next day sprinkling in more water, is necessary, till there is no dust to fly, but taking care not to add too much, so as to leak away the salt. It should be kept damp, turned over frequently, and the longer it remains (in reason) the better; three weeks will do, but not so well as three months. J. PRIDEAUX.

THE BEST MODE OF MIXING SALT AND LIME.

"Soda made according to the plan of J. Bennet, Esq., Mr. P. for Wiltshire, I have found a good application to land at the proper time. Lay three inches of unslaked lime, ten feet long and six wide, as a bed, and then spread one inch thick of common salt. Repeat these layers till a bed two feet high is formed. If the mixture is made in summer, when it is dry, it may be in the open air; at other times, under cover. After ten days, turn it over, and repeat the turnings five or six times, at intervals of seven days; spread from a cart about sixty bushels per acre, covering the horse with a sheet or cloth, to prevent burning the hair off. It should be ploughed in before wheat-sowing."—*Hillyard's Practical Farming.*

Idleness wastes a man as insensibly as industry improves him.

Correct taste is always true to nature; the "beautiful appearance of the earth and heavens," the regular change of the seasons, the succession of day and night, fill the heart of him who is influenced by it with rapture. The nearer works of art approach the perfection of nature, the more consonant they are with good taste, and they command lasting and universal admiration.

Agricultural Journal

AND

TRANSACTIONS

OF THE

LOWER CANADA AGRICULTURAL SOCIETY.

MONTREAL, APRIL, 1850.

It cannot be denied that many of the population of Canada are dissatisfied at the present state of the country, as regards trade and commerce, the low prices of our products, and the want of full employment for the working classes. We do not dispute that all these causes of dissatisfaction do exist to some extent, but we do not attribute them all to the same causes, that, perhaps, others do, nor would we propose the same remedy. It is not in the cities or towns that the remedy is to be sought for. The improvement of the country and her agriculture, is the only remedy that can relieve us, and remove the cause of dissatisfaction. Houses and stores were multiplied in our cities and towns, and no attention given to the country, or its productions. All the movable capital that could be had, has been employed in the cities and towns, and scarcely any directly applied to production in the country. The low prices of agricultural productions may discourage farmers from expending money, or labor on improved husbandry, but the only remedy for low prices is the increase of productions that will be of the most value. Oats, barley, and peas, are low this year, but farmers should be in such a position as not to require to sell these articles at extremely low prices, and should only grow them for their own use, unless the prices were remunerating. They should rather grow wheat, raise horses, and cattle, and have butter, cheese, and wool to sell, which bring fair prices, even now. It would not be advantageous to produce crops that would not remunerate, but there is no necessity that we should do this, when we may

produce articles that will pay. If farmers were properly instructed, and our system of agriculture more perfect, we should know better what crops to grow, how to cultivate them, and the proper uses to apply them to. It may be imagined what spare produce a farmer is likely to have to dispose of, from a poor exhausted farm, and a poor stock, badly kept, and we know that many farms are thus circumstanced? To improve this state of things, should be one of the first objects with all true friends of Canadian prosperity. Capital is wanted to farmers, and it is all very fine to say to them, "Create your own capital;" but in most circumstances the thing is impossible, and unless they are to be provided with an accommodation in some other way, they may rest in their helplessness, and poverty. It appears to us that the true remedies for the improvement of the condition of Canada, are the establishment of Model farms and Agricultural Schools for the education and practical instruction in agriculture, of young farmers—by circulating useful information amongst farmers of the present day—by introducing "Associations of Agricultural Credit," under proper regulations and management—by the establishment of manufactories for supplying our own wants, on as good terms as we can obtain them elsewhere—and by all parties uniting cordially to carry out these measures for the general benefit of the country. We propose the establishment of manufactories, in order to find customers for products, if we cannot export them to advantage, and to find employment here for those that might otherwise leave the country to seek it elsewhere. The due improvement of agriculture would also give employment to many additional hands. These are ameliorations that are in our own power to effect. It may not be possible to obtain at once, all the benefits that these measures would be sure to produce in reasonable time. So far as agriculturists are concerned, they are seldom anxious to become rich in a hurry; knowing the difficulty of doing so, they,

we know, will bide their time with patience, if they can only see a prospect of being able to improve their condition. To all other parties we would say, that riches accumulated gradually, from the improved trade and resources of our country, are much more likely to remain permanently, than when rapidly acquired by any other means. What we are anxious to establish is, that the unsatisfactory state of the country, is capable of being improved by means that are within our own power, if we only employ them judiciously. We are anxious to see every interest in the country in a prosperous state, but we feel convinced this state of prosperity is impossible, while agriculture is left in a languishing, unproductive state, in a very large portion of this country. We may be thought in error in our estimation of the vast importance of agriculture, but if we are, we would beg some party who considers us so, to enlighten us upon the subject for the public good. We would be sorry to be the means of inclining the attention and industry of the people in a wrong direction, but if agriculture is of so much importance as we pretend, it is impossible to do too much to secure its improvement and prosperity. We can see encouragement held out to us in the free navigation of the St. Lawrence, and in the hope of freedom of trade with the neighbouring States. These are advantages that cannot fail to be of vast benefit to us, if we only increase our productions to enable us to realize this benefit. If we are able to sell grain in the United States, we shall certainly be able to sell cattle there. We cannot perceive that there exists any impediment to prevent us from gradually attaining a most prosperous state, if it is not our own fault. We must not expect all this in a year, but it will come in good time, if we employ the means in our power with united energy. Agriculture has been too long neglected to bring it to what it is capable of in a short time, but let the necessary measures be commenced at once,

and we shall soon see that it is capable of securing the prosperity of Canada.

THE CANADIAN HORSE.—We again beg to offer some observations respecting the Canadian horse, that might be so valuable an article of produce for sale to our neighbours of the United States. For more than twenty years we have been endeavouring to persuade Canadian farmers to cultivate the unmixed breed of Canadian horses, as the best and most suitable for agricultural purposes, and the most profitable for sale. Agricultural Societies, we conceive, have been much to blame in not having a distinct class for pure Canadian horses, and brood mares, and excluding all animals that were not manifestly of pure breed. They might have any other classes of premiums they thought proper for horses of mixed breeds; but in the Canadian class no mixed breeds should have been allowed to compete. We know that such classes of premiums have been adopted, but we also know that mixed breeds of horses were allowed to compete in them, and awarded premiums. Objection is made to Canadian horses as too small for heavy work, but this defect, if it exists, would be easy to remedy, by careful selection, and attention in breeding. But as an article for sale we should see them so much sought after in the United States. Parties may boast of obtaining high prices for tall horses of other breeds, but we feel persuaded that no breed of working horses will pay their owners better for what they cost them, than the pure breed of Canadian horses. There are very many small horses through the country certainly, but the cause of this is carelessness in breeding, and insufficient keep. In every parish in Lower Canada, the very best Canadian stud horses should be kept for breed, and all the County Agricultural Societies should give every possible encouragement to the best stud horses of

pure breed. We have seen stud horses brought into Canada that were worthless, compared to stud horses we had in the country, and the latter neglected, to the great injury of farmers. We have had frequent opportunities of seeing how highly the people of the United States value the real Canadian horses, even when very much under-sized. Other descriptions of horses may occasionally be required for the carriage, for the saddle, or other purposes, but what signifies the number that would be required for these purposes compared to those for working, and to supply the demand from the neighbouring States, who do not want to buy horses here for the carriage or saddle? It is very proper to introduce new breeds of animals when those we have are bad and worthless, but it would be absurd to introduce unsuitable and inferior animals, when we have better of our own. The Canadian sheep and swine, are of inferior quality, and require very much to be improved. The Canadian neat-cattle, however, are very susceptible of being made a valuable stock, and very suitable to our present state of agriculture. When this would be improved, the cattle would be sure to improve with it; sufficient keep, careful breeding and judicious selection, are what is requisite to make Canadian neat-cattle, a most profitable stock for most farmers.

AGRICULTURAL REPORT FOR MARCH.

March commenced with high winds and cold weather, and up to this period, has maintained the usual character of that month, windy and changeable. We have had frequent falls of snow, but on the whole, there is less snow now on the fields than at the commencement of the month. There is, however, a considerable quantity of snow yet on the land, and we can scarcely expect all will disappear early in April. We think it favourable to agriculture that the snow should cover the land to the end of March, but the sooner we have spring after the first of April the better, as it

admits of farmers putting in their seed in good season. The best wheat and oats we ever raised in Canada, were sown the first week of April, but this was previous to the appearance of the wheat-fly. This insect has done immense injury to Canada, and we have no doubt is the chief cause, although not the only one, of the present depressed state of the country. It may be imagined what would have been the consequence to England, had she been unable to produce good crops of wheat for the last fifteen years. We can safely say, that the loss of the wheat crop to Lower Canada, in a pecuniary point of view, was fully as severely felt to the farmers here as it would be to the English farmers, because the latter are not so dependent upon the wheat crop exclusively, as the farmers of Canada were. We were not altogether prevented growing wheat, it is true, but for ten or twelve years only a very small proportion of wheat was grown here, compared with what might have been grown were it not for the wheat-fly. The last three or four years the Black-sea wheat has been grown to a considerable extent, but the necessity of late sowing has rendered the crop rather precarious, unless the season is very favourable. If fall wheat had been sown last year it would have had a good chance by a deep covering of snow. We believe that fall wheat might be successfully cultivated here, provided it was sown early in the fall, (in August,) and covered properly, or sufficiently. It would be a great advantage if farmers could sow a part of their wheat in the fall, but unless sown early it would be useless to try it. The lands of Upper Canada, were, we understand, much exposed the past winter to severe frost, with very little snow. It cannot yet be ascertained what effect this may have on fall sown wheat. The wheat plant is very hardy, and where it has taken good root from early sowing, and the soil is well drained, it may not suffer any injury. The great danger is in the spring, when the soil is becoming thawed, that the roots are

liable to be thrown out, and many of their fibres broken and torn asunder, by the action of alternate freezing and thawing. In dry soil, however, this will not be found so injurious. The steady winters of Lower Canada, we conceive, are much more favourable for the country than the changeable winters of Upper Canada or the neighbouring States. We are not so liable here to unseasonable frosts in the spring or fall as they are elsewhere, and this is a great advantage, as young crops after appearing over ground are always more or less injured by frost, if subjected to it. In like manner, early frosts in the fall are most injurious to crops if it comes upon them before they are at maturity. We are certain that crops suffer more from these causes in other parts of North America than here, with all our depth of snow and long winters.

The moment the land is in a fit state for working, sowing should be commenced. Farmers might venture to sow some of the old varieties of Canadian four months' wheat, if sown early in April, but perhaps it might not be well to try it to any great extent lest the fly should injure it. The Black-sea wheat might also perhaps be sown early, but we shall not take upon us to recommend the general sowing of this wheat previous to the 15th or 20th of May. We know the fly is still in the country, and if by sowing early the wheat would be greatly damaged by the insect, it would be a serious loss to farmers and to the country. Oats, peas and beans, may be sown as early as the soil can be harrowed, and potatoes should be planted early. We suppose that farmers are aware now that applying large quantities of recent manure makes the crop of potatoes more liable to disease, and that they will be cautious, in planting, in applying manures, to use those that are known to be the least objectionable. Charcoal, soot, ashes, salt and lime, are all favourable to the production of potatoes that will keep sound. We should not be covetous to raise very large crops that may rot before

our eyes, and that in any case are not so good for the table as moderate sized potatoes. Charcoal, we believe, is one of the best substances that can be put in the drills with the seed, with any other of the above substances that may be applied. Dry soil is the most suitable for potatoes. The plan of sowing Indian corn, or beans, in every alternate row with the potatoes, we conceive to be a good plan, and we believe, by whatever means the effect is produced, that it has a tendency to preserve the potatoes from disease. Potatoes are too valuable and too necessary to us, not to deserve all our attention, in order to grow them, and secure them from disease, if possible. The varieties of potatoes that are the least subject to disease, should be those planted. Those known as cups we have found to keep as well, if not better, than any other; but it would not be well to be confined to one, two, or three varieties. Potatoes should be planted immediately after they are cut, and covered at once. It is well to mix lime or gypsum with the sets after they are cut, and previous to planting, and to wet them sufficiently to cause the lime or gypsum to adhere to the sets. The practice of sowing peas and oats to a certain extent for the farmer's own stock is, we believe, a good one. We have seen them ripen very well together. The small white or grey pea, mixed with the oats of the country, will generally come to maturity together. But even should they not do so exactly the loss will not be great. The farmer will find that sowing in this way the produce will be larger than if the crop was unmixed, and the straw will be excellent for fodder. Tares, or vetches and oats, we have frequently sown together, and they produced most luxuriantly, and were good food for stock. Farmers' cattle and sheep are often much stinted in grass in July and August, and if they would sow some vetches and oats mixed, or oats and peas to be cut and fed out at the time the pastures begin to fail, it would be of great benefit to the stock, and profit to the farmer.

Clover or lucerne would answer the same purpose, and so would Indian corn, or Rye sown thick and cut down green. There are many improvements in the farmer's power that would not be expensive, and would pay well. Even one acre of any of these crops we have mentioned, to be cut down green in the latter end of July and August, and fed to a farmer's cattle, would be a great advantage, and keep the cattle in good condition until they would get the after grass, or until the pastures would be improved by the fall rains. We would observe here, that pastures well stocked with the roots of grass, and forming a close swarth of grass, are not much affected by drought, but will keep good when our common pastures that are only of one year's standing and not seeded down will be affected at once by drought. The sowing of barley may be deferred until after the first of May, or until the weather has become warm. It is generally supposed, and very correctly, that the surface of well ploughed land is much ameliorated by exposure to the effects of the winter frosts, and are much better prepared for causing the seed to produce a good crop than if the same soil was ploughed immediately before sowing. The best plan is to use the scarifier or grubber, with land ploughed the previous fall immediately before sowing, and thus effectually loosen the soil without turning down the surface that has been ameliorated by the frost of the previous winter; and then drill or harrow in the seed, never covering it very deeply, one inch being sufficient for barley. Land fresh ploughed in spring is more disposed to run together after rain, and to form clods or large lumps if the weather should prove very dry; but land which has already had the action of the winter's frost and atmosphere upon it, is not so disposed to cohere; and the scarifier or grubber, by leaving this surface soil uppermost, renders it less susceptible of doing so, or of becoming very hard. There is no species of grain that requires a more thoroughly drained soil than

barley, unless where there is an open subsoil. It is a most tender grain in the early stages of its growth; a dry subsoil and fine state of tilth are necessary, and prevent injury from a succession of heavy rains and cold weather after it is sown. There is an old adage that barley never succeeds well "if the land drains run after it has been sown," and we have proved that this is a correct adage in Canada. It would be better to defer the sowing of barley unless the soil is in a fit state, and when the season is moist, the rolling should be deferred for twelve or fourteen days after the grain is sown. This great care in the cultivation of barley is the more required, as unless the seed comes up evenly and together, it will not mature together, and will never make a good malting sample. The washing of the seed, and skimming of the light floating grains, and steeping the seed in liquid manure, and drying it with lime or ashes previous to sowing, is a very good plan, but it should be sown immediately after this preparation, and if not, spread thinly on the barn floor until sown. Barley is the best grain to sow grass seeds with in laying down land. At all events, any land fit to produce good barley, will certainly be in a good state for laying down for meadow or pasture. In England, barley was considered as the king of all crops, having too much pride to follow any other white straw crop, or allowing any one to follow it. From the experience that farmers have acquired in the sowing of wheat early and late, we can scarcely take upon us to advise them on the subject, as both early and late sowing have been adopted and succeeded. The safest plan, we would imagine to be, to make experiments this year also of early and late sowing, and not risk sowing the whole at one period. The state of the spring and of the soil should be a guide to us in sowing, to a considerable extent. If we find both favourable, very early, it would be a pity to allow the opportunity to pass without sowing. We should have no hesitation in sowing provided

we could do so previous to the 15th of April, and take our chance for the fly. The most dangerous time for sowing is from the 15th or 20th of April to the 20th of May. We know that good crops of wheat may be grown here, sown about the 20th of May, and they are not liable to be injured by the fly. The sowing should not be put off for a moment after this time, as the weather generally becomes warm and dry, and greatly checks the progress of the young-wheat plant when sown very late. In every case, the seed should be washed in a strong pickle, and the light grains taken out previous to sowing. If mixed with any seeds of weeds, mustard or wild pea, they might be separated with a wire sieve; and certainly there is abundance of these seeds in most of the lands without sowing any with our grain. We need not remind farmers how much consequence it is to have the soil in good order for every description of crop. To have it well drained, and sufficiently pulverised, to admit of the roots of the seed extending freely to obtain the necessary nutriment. The poor, thin crops we so frequently see here, result from sowing on land that is not sufficiently drained or dry when sowing, more than from mere exhaustion of the soil. It is also a necessary consequence of badly drained soil that it cannot be properly ploughed or harrowed. All parts of the cultivation of the soil are so connected with each other, that if any part of the process is imperfectly executed it affects the whole, and prevents the proper execution of the other parts. Insufficiently drained land cannot be properly ploughed, and ill ploughed land never can be well harrowed, until again ploughed. Thus it is in every branch of husbandry, one error or imperfection produces many others; and unless there is a regular system adopted and carried out, no profitable or valuable returns can be obtained from agriculture. This, that, or the other farmer, may by chance in a favourable season or other accidental circumstances occasionally obtain a good crop, but

to succeed in raising regularly good crops, or other things, a proper system must be adopted and as regularly carried out. When this is done, good crops will generally result from good cultivation, unless in very adverse seasons, and we may be thankful we have not many of these in Canada. In sowing peas we believe it would be found to succeed well, to form small furrows with the plough previous to sowing, the seed will fall into these furrows in harrowing, and the crop will generally be stronger and better. Indeed there is little doubt that sowing all descriptions of grain in drills of proper depth would be advantageous, as the seed would be evenly covered—of a uniform depth—the straw would be stronger—and the ear and grain larger and fuller. Carrots, Parsnips and Mangel-Wurtzel, should also be sown as soon as possible, steeping the seeds in liquid manure previously.

March 27th, 1850.

We give in this number the Report of a Committee of the Legislature of the State of New-York, on the subject of an Agricultural College, Model Farm, &c., which we recommend to the attention of our readers. It appears from this document, they are determined in that great State, to provide the same advantage for agriculturists, that other classes have had long ago. It is a most extraordinary fact that considering the agricultural class constitutes so large a majority, both in the United States and in Canada, this essential requisite for the due instruction of young agriculturists, should have been so long neglected. If agriculturists had been properly alive to their own interest, they had it in their power at any time, in either country, to have insisted upon such establishments. The want of them has unjustly deprived the majority of the people of the best means of instruction, that the minority has always had; hence, the chief business of the country, and that upon which the prosperity of the country mainly depends, has had

no fair chance of advancing in improvement, as other employments or professions had. The most suitable means of education and instruction has been provided in schools and colleges for all other professions, except for agriculturists. In all the Reports of the Common School systems of this country, there is scarcely ever to be seen one line relative to an agricultural education, or the necessity for it. It would appear as if the subject was unworthy any consideration whatever by those who are entrusted with the education of the people. We imported, in 1848, on behalf of the Lower Canada Agricultural Society, several small agricultural works, in the hope that they would be introduced here as school books, making such alterations and modifications as would be necessary to make them suitable for this country—and translating them into the French language. For this, an arrangement might be made with the authors of these works, to allow their republication here. No action, however, has been taken in the matter, and these little books have been allowed to remain no better than waste paper, upon the table at the Agricultural Room, up to this time. The selection we made was very limited of course, as we only were desirous of showing that suitable books for schools might be had. There are very many agricultural books that might be introduced in schools, and that would not require a school-master who was a perfect agriculturist, to explain them to the scholar. We know many such books that are quite as suitable for schools, as any we have ever seen in any catalogue of school books. By inducing, or at all events affording an opportunity, for our youth to read works on agriculture, it might create a taste or desire to be better acquainted with the subject, and in any case, it would not be estranging them from the business of their fathers, and attaching them to any, to the most useless, or perhaps, to no profession, rather than that of a farmer. It is time to see an end of this inconsistent, and

injurious absurdity. If any education is provided for the rural population, let it be of the most useful possible character for them, if they are to pay for it. Objections may be urged to the establishment of Agricultural Colleges and Model Farms, by those who are either unfriendly or indifferent to agriculture, but there cannot be any reasonable objection offered against the introduction of books relating to the science and art of agriculture into our common country schools. We shall answer for it that they will do much less harm to the pupils than many books that are permitted in schools. Agriculturists are most unjustly accused of being slow to adopt improvements, and as being behind the age, and other classes. But while every possible aid, by suitable education and otherwise, has been abundantly provided for all other professions, agriculturists have been neglected, and no suitable provision made for their instruction—no more than if it was a useless or injurious profession to be employed in. Those who understand the true position of this country, and who wish to see it in a thriving and prosperous condition, will not oppose the establishment of Agricultural Colleges, Model Farms, and all other aids calculated to promote the improvement of agriculture, by a perfect and practical knowledge of it in all its branches. The expenses of such establishments are comparatively nothing, compared with the immense benefits they would produce to the country. By what other means, we would ask, could the annual produce of the country be doubled, except by her agriculture? We have no hesitation in saying that the agricultural produce annually created might be doubled in amount and value, by a more perfect system of agriculture. By what extent of commerce, trade, and manufactures, could we derive the same amount of benefit annually? All these latter are very good in their place, as the consequences of a prosperous state of agriculture, but unless they are based upon this foundation,

they cannot be permanently successful or profitable to the country generally. Numerous plans and speculations may be proposed for promoting the prosperity of Canada, while the principal means that is in our power is neglected. The judicious cultivation and management of land and stock would be a more certain source of wealth and prosperity to this country than if we were to find the most valuable mines that exist on this continent. There is a limit to the value of mines, but the produce of agriculture will be always in demand, while mankind continue rapidly to increase. A productive and prosperous agriculture necessarily creates manufactures and trade for the supply of agriculturists, and this is the most natural, the most healthy, and the most happy state of any country, and for this, in particular. The "Associations of Agricultural Credit," which we have so frequently brought under consideration, we hope, will find supporters in all true friends of this country. We do not fear the fullest discussion of the subject, and enquiry as to its working in countries where long established. It is not giving agriculturists a fair chance to deny them any reasonable aids to improve their condition. This vast country, of superior soil, is in a comparatively waste state, for want of capital to draw forth its treasures from the soil. If we are to take example by the progress of improvement of agriculture in other countries, we shall see that these improvements are only produced by the application of skill and capital. We must improve by similar means, or we must ever remain in a backward state, and see all our natural advantages going to waste before our eyes, without being able to make any use of them.

T. B. Johnston, Esq., Secretary of the New York State Agricultural Society, has very kindly sent the Lower Canada Agricultural Society, a "Prize Essay" on Indian Corn, a "Report of the Commissioners appointed to

mature and report a plan for an Agricultural College and Experimental Farm"—a copy of Professor Johnston's Lecture at Syracuse, and a small parcel of Broom Corn Seed—for which we have been instructed to return thanks to Mr. Johnston, a duty that affords us much satisfaction. The seed will be distributed to members of the Society, and we hope that Broom Corn will be extensively cultivated here soon, as we are certain it would at present prices be a very profitable crop. Mr. Johnston has also offered to send the L. C. A. Society, copies of Essays that have been published by the N. Y. S. Agricultural Society, should he find opportunity; they would be very acceptable, as no doubt, they are valuable.

To another gentleman in the State of New York, C. N. Bement, Esq., we have also to offer the thanks of the Lower Canada Agricultural Society, for his excellent work, entitled the "American Journal of Agriculture and Science." We have not yet had time to examine it sufficiently, but from what we have seen of the work, we estimate it highly. It is very satisfactory to have to acknowledge such friendly presents from Agriculturists, and we shall be happy to make any exchanges at our disposal, if considered of any value, by parties who may be disposed to send us Agricultural Books or Periodicals for the Library of the L. C. A. Society. We cannot boast of a large library, but we certainly have as good works as are in print on the Science and practice of Agriculture, in books and periodicals. If a useful Library is required, a few well selected volumes will be much more valuable, than to purchase books by the foot to fill up a parcel of shelves, that are of little use but for ornament, if they are well bound and gilt. There are many agricultural works that only contain a very small proportion of useful information, and practical instruction for farmers. A well instructed, Agriculturist may find useful information in almost any work published on agriculture, but a farmer who has

his business partly to learn, may be led into serious errors by works that are not plainly practical, and written by parties who understand their subject. Above all things, authors on agriculture require to understand the subject practically, or they will be sure to be in error frequently, however talented they may be. We often see exaggerated statements published, that can have no foundation in fact, and this is one cause that book farming has so little credit with farmers. It is very necessary that parties who become authors on agricultural subjects, should be most cautious in publishing any statements that they are not convinced to be facts. If they do otherwise, they should state the matter simply, and acknowledge that they are not acquainted with the matter, but submit it for consideration.

It will soon be time for the Lower Canada Agricultural Society to take some action for the proposed Cattle Show and Exhibition to take place at Quebec next fall. Unless this Exhibition is to be worth seeing, it would be better not to have any. The city of Quebec will doubtless contribute handsomely towards the funds necessary for this great Fair. The Legislature, we hope, will grant a liberal aid to this undertaking, in order that it may be worthy of the country, as well as useful to the progress of improvement. The collections that might be made for entrance, to the place of Exhibition, would also assist to meet the necessary expenses. The County Agricultural Societies should all lend their aid, as the whole country may participate in the benefits of such an Exhibition. Every section of Lower Canada will have easy access to Quebec with their stock and produce, and we hope steamboats and rail-roads will be liberal, and make the most moderate charges in all cases. The Exhibition, if what it might and should be, would be productive of much good. It would bring the best samples of every species of domestic animals together, and afford an oppor-

tunity of estimating their comparative merits. It would bring samples of our manufactures of every description before the public, and show what we are capable of doing. For samples of grain, a sufficient amount of premiums might be given fully to compensate the owners, and allow the samples to belong to the Society for distribution for sowing, on such terms as might be thought expedient—thus securing all the advantages of picked samples for seed for those who might not have any good seed. Unless this plan is adopted, it might be better not to offer any premiums for samples of grain. The regulations and conditions for the Exhibition should be such as to secure advantages to the public, fully to compensate for any aid granted the Society from the public funds. The sole object of the Exhibition should be to promote the improvement of our agriculture, and to give encouragement, as far as possible, to Canadian manufactures of every description that are useful, and that could be made here as cheaply as we could import them. If the inhabitants of Canada are actuated with the desire to advance the welfare of the country to the same extent that the people of the neighbouring States appear to feel, we should be able to have an Exhibition at Quebec next fall that would be as interesting as that we had an opportunity of seeing last year at Syracuse, although, perhaps not so numerously attended.

It would be very desirable to have a Museum of agriculture implements (we have already, seeds, plants, &c., established in Montreal.) It is, we conceive, very discreditable to a country so decidedly agricultural, that we should be without a Museum. Who are to blame for this want, or who should supply it? We could reply to this, but we submit it to the consideration of others, only observing, that upon whomever the duty devolves, the Museum should be provided, if agricultural improvement is desirable. There is another great want in our fine city of Montreal. A Botani-

cal or Public garden, for which the soil, situation, and climate, are so very favourable. The people's attention appears to have been fully occupied in extending streets, and building houses, without ever thinking of providing a beautiful garden for the pleasure, health, and instruction of the public. Montreal is a city of fine houses, and with, perhaps, a population of 50,000, and there is not a public garden, or a suitable promenade of any description to pass an evening, unless upon the dusty and heated streets. We are always thankful that our lot has been to live in the country, where the beauties of nature cannot be hid from us by walls of stone or bricks. We cannot help imagining that the fact of their being no public gardens, or walks shaded by beautiful trees and shrubs, in or about Montreal, is a proof that agriculture or the country is not held in much estimation by our citizens. There are many beautiful *private* gardens, and shaded walks about Montreal, but what are these to any but their owners? The poor man, or the mechanic, can never set his foot there. In many parts of Europe private gardens are open to the public, and without any injury to the owners, and there is scarcely any city without public gardens, and public walks. Parties do visit the Mountain near Montreal, but we believe they cannot do this without its being considered a trespass on private property. The mountain would offer beautiful walks, if it were public property, and judiciously laid out, and improved. It may be thought we have nothing to do with these matters, but we conceive that the establishment of a Public Botanical Garden, with every variety of trees, shrubs, and plants, would be exceedingly advantageous to Agriculturists, as well as to the inhabitants of the city; and there cannot be any doubt, that public walks shaded with beautiful trees, and shrubs, (not the unsightly Lombardy poplars,) would have a very beneficial influence upon our citizens, and interest them for the improve-

ment and prosperity of agriculture, and attach them to the country.

Leaves and small branches of trees, with the leaves on, and while full of sap, are said to be excellent manure, and they must be so, containing as they do the most fertile ingredients that can be extracted from the soil, and the atmosphere. In this country what a vast amount of manure might be obtained where the forests are convenient. The young tender shoots and branches might be collected without much expense, and by placing layers of them while fresh and green, in the compost heap, we have no doubt they would enrich the compost as much as the same quantity of farm-yard manure would do. It is only at a certain period that those shoots and branches, can be made available, while they are young and soft; when they become hard, though they may contain manure, they will not rot or decay so readily in the compost heap. Lime should be mixed with the compost, when shoots and soft branches of trees and shrubs are put into it. Considerable assistance of manure might be collected by the industrious farmer, who would be convenient to the forest, as there are many plants which might be cut and carried to form compost for future use. They should be covered well, or mixed with earth immediately, on being cut, before they would wither or dry. In the dry and barren sands of Holland and Belgium, they plant trees for the purpose of improving the soil, and when they arrive at the age of about 25 or 30 years, the trees are cut down and disposed of, and the poor land is found so much improved by the trees, and fallen leaves during this period, that it is capable of producing good crops of roots and grain. In fact, the nature of the soil appears altogether changed, and is no longer pure and barren sand, but appears largely mixed with a better quality of soil. Every means of obtaining manure should be resorted to by the industrious

farmer. In applying compost containing small branches, as top-dressing to meadows, should any of the wood of the branches remain undecayed, they could be very readily raked off the land, when spread and bush harrowed. We stated in a former number, that small branches or brush wood cut while green, in the fall, and spread over grass or ploughed land, and allowed to remain upon it until the spring, would greatly improve the soil, and they might then be gathered off and burned or charred for manure. This plan would of course give some trouble, and take some time, but where there is a difficulty of obtaining manure, it would be better to try this plan, than allow the land to remain incapable of producing crops. It is not in every situation that branches and brush-wood could be had, but certainly in many places they might be had, and the cutting of them will be as useful to the place they grow, as their spreading upon the land would be where applied as a manure. Whatever cause it may proceed from, there cannot be a doubt that spreading branches on land as we propose, is beneficial to it, whether it is by the shelter they afford, or some ingredients they part with that improves the soil. We have frequently seen this effect, though we have not seen the branches regularly applied to produce this effect as we now propose.

We have seen it recommended by very good authority, that all seeds before sowing should be steeped, until saturated, in liquid manure, of sufficient consistancy to form an adequate coating for each grain, no more being suffered to adhere, than is actually required, in relative proportion to the species, as too much action is over exciting to the delicate sprouts under an artificial system. The process is peculiarly beneficial with respect to spring wheat, peas, beans, barley, carrots, beet, and early potatoes. Under operations of this nature, and with prudent management, great advantages will be

gained, in the early vegetation of the seed, and coming rapidly forward, in advance of grass or weeds, if there are any in the soil. Seed thus prepared, and put into soil that has been cultivated and manured suitably, will have every chance of success. Very dry and warm weather after sowing, might perhaps check seed that was steeped, but under good management, a farmer will seldom have to repent steeping the seed in liquid manure previous to sowing. These matters are not to be neglected, and when farmers do not attend to them, it shows a carelessness and indifference by no means creditable.

With a good chaff-cutter in the old country, one man is said to be able to chaff hay sufficient for 18 head of stall-feeding cattle in two hours, allowing from 21 to 28 lbs. weight for each. It would be interesting to know if hay can be chaffed with the same ease and expedition with us, by any of our machines. The chaff does not require to be cut so short for cattle as for horses, but the statement we have seen does not say what length the chaff was cut to. It is generally admitted that chaffing hay for horses, cattle and sheep is a great saving, and prevents much waste, but we are not so confident that chaffing straw is a judicious plan, unless to mix with horse food. The saving of straw is no consequence, or should not be, where what the cattle rejects or wastes, goes into the manure. Straw would not, therefore, we conceive, repay the expense of chaffing it. We have heard of oats being cut into chaff, attached to the straw, without thrashing, for horses, and we believe it to be a very good plan, and that it might answer well for cattle also. In all cases that chaffed hay or straw is fed to animals, they should have roots or soft food occasionally supplied to them, to keep them in health.

We have much satisfaction in assuring the Members of the Lower Canada Agricultural Society and their friends, that we are constantly

receiving unquestionable testimony of the great interest created throughout the country for the improvement of Agriculture. There is a most anxious desire manifested for the establishment of Agricultural Schools and Model Farms, where the youth of the country would receive a suitable and useful education, and be instructed in the practical art of Agriculture. From every section of the country where the Agricultural Journal is sent, the most encouraging letters are received of the good it is producing, by creating a spirit for enquiry, and an anxiety to introduce a better and more profitable system of farming. This is exactly the object of publishing the Journal, and we confidently hope that the Society, at whose instance it is published, will not be disappointed, but will ultimately have the satisfaction to see their laudable and disinterested efforts for the good of the country successful beyond their most sanguine expectations.

We have to apologize to our subscribers and the members of the Lower Canada Agricultural Society, for our neglect in not referring to the Rules and Regulations of the Society, before we gave notice, in the last number of the Journal, for the Annual General Meeting of the Society, to take place on the 15th of March last. We had forgotten that the Annual Meeting was only to take place during the Session of the Provincial Parliament. This Rule was made in order to have the benefit of the presence and advice of the members of the Legislature at the Annual Meeting. There was no idea at that time of the changes that have subsequently taken place. The meeting did not, of course, proceed to any business. When Parliament meets, notice will be given for the Annual Meeting of the Society, and then the Rule may be altered so as to admit of the Annual Meeting taking place whenever the Society may think proper. The Directors and Officers elected at the last Annual Meeting remain in office for the present.

We have been much disappointed by not being able to procure a satisfactory translation of two or three valuable communications, which appeared in the March number of the French Agricultural Journal, and which we expected should appear in the April number of the English Journal. We find it much more difficult to make a good translation of French into English, than of English into French. We hope our respected correspondents will write to us in English the next time, and we shall have no difficulty in translating into French. We still expect to be able to have a good translation, in English, of some of the correspondence which appeared in the last French Journal.

We have received a letter from a Subscriber at Eaton, respecting the Course of Agricultural Lectures delivered at Albany, in January last, by Professor Johnson. We beg to acquaint him, that we have requested copies of those Lectures, when published, and when we receive them, we shall be better prepared to reply to his further enquiry. In the meantime we shall see what would be the charge for 100 copies of the Lectures, by the publishers at Albany or New York. They could not fail to be most valuable for circulation.

Common, or the most inferior oil, is said to be a good top dressing for heavy clay land under meadow—40 gallons is mixed with 120 bushels of screened soil, and the mixture is allowed to remain for one month before it is applied. It is said to be equal to 40 bushels of bones and 80 bushels of burned soil, as top-dressing for an acre.

TO DRIVE AWAY RATS.—Mix one shilling's worth of Spanish flies in a bottle of the best French brandy; cork it well, and after shaking deposit the brandy in smooking dung; let it remain six weeks, and it will be fit for use. A few drops of this liquid is said to entice them from their holes into any kind of trap you may choose to employ. I have not used the remedy myself, but it is well worth a trial.—*A Subscriber.*

STATE OF NEW-YORK.

In Assembly, March 1, 1850.

REPORT

Of the Special Committee on the Agricultural College and Experimental Farm.

The select committee to which was referred the Report of the Commissioners appointed to mature a plan for an agricultural college and experimental farm, and so much of the Governor's message as relates to the same subject, together with the memorials and petitions of various boards of supervisors, and agricultural societies and private citizens in favor of the same object, have had the subject under consideration, and submit the following

REPORT.

The great subject entrusted to the care of the committee, has for several years past excited a deep interest throughout the entire State. Twice he distinguished citizen who now fills the Executive chair, has pressed it upon the consideration of the Legislature; various boards of supervisors, agricultural societies and private citizens have called upon us to act in the premises. The Committee on Agriculture in the Assembly of last year, submitted to the House an interesting report upon the subject, which will be found in their documents. The able board of commissioners last year appointed by the Governor, have matured and reported a plan for an agricultural college and experimental farm, and the same is now upon our files. Public opinion still moves on in the same direction and with accumulated power. It would be but a waste of the time of this committee, and wearying to the patience of this House, again to go over the ground embraced in those reports. The most ample justice is therein done to the importance of the object contemplated, the present state and past history of similar institutions, the branches of knowledge to be taught, and the expense and general outline of the institution.

It seems necessary for this committee now, only to present a few brief considerations, which seem called for by the nature of the bill which they ask leave to introduce.

The committee with entire unanimity assent to the correctness of the conclusions arrived at by the said commissioners, that such an institution as has thus been called for by so wide spread a public opinion, should be established, and that the same should be founded by the State. The necessity for its existence is found in two very important facts, the first is, that two-thirds of the entire population of the State is engaged in agriculture, it is the great occupation of our citizens and the primary source of our wealth, and must so continue through all future time. Whatever adds to the value or the dignity of labor, tends to the elevation in comfort and

respectability of the great body of the people. A very slight increase throughout the State of the productions of the earth, will *annually* return to the people more than the entire amount which will be expended on the proposed institution, should that sum even exceed any contemplated bounds.

The second ground for its necessity is found in the most *remarkable fact*, that while a very large majority of the inhabitants of the Union are engaged in agriculture, while it is everywhere regarded with respect and held in the highest favor, there is not *upon the continent* a solitary institution where a thorough scientific and practical knowledge of agriculture can be obtained. Millions have been expended in founding institutions to teach law, theology, and the higher departments of science and literature; and even the blind, the insane, and the deaf and dumb have not been overlooked and forgotten. But that great science which *lies at the foundation of all others, and is paramount in importance to them all*, has been left to struggle along as best it might, guided by the flickering light of an uncertain experience, and unaided by the fostering care of the government which it sustains. The results of modern improvements, and the progress made in the present century, in the science of agriculture, demand at the hands of the State the most favourable consideration of this subject, and that this great desideratum should be supplied without further delay. The great farming interests of this State have too long been overlooked and forgotten, or sacrificed to the interests of more artful or more clamorous bodies. But now when their wants are understood, and their requests are duly presented to our consideration, they are too reasonable to be longer postponed. To this point the attention of your committee has been earnestly directed. We have been urged instead of following the recommendations of the commissioners above referred to, to advise the establishment of agricultural departments attached to some of the present literary institutions of the State. And various reasons have been presented to our consideration, in favor of this plan; but your committee have been entirely unable to satisfy themselves, that this course would be wise in itself, or satisfactory to the people of this State. All the memorials referred to your committee from whatever sources they may have emanated, as well as the reports and recommendations above alluded to, concur in favor of "an agricultural college and experimental farm." Public opinion has been directed to this mode of accomplishing the desired end; and seems to your committee to have concurred in it. They have been unable to discover from any source that the course first above referred to, would be in accordance with the wishes of any considerable body of our fellow citizens, unless it be those

who represent the interests of institutions already established.

But in addition to this, while we have been unable to discover any very cogent reasons in favor of attaching agricultural departments to existing institutions, we are clearly of the opinion that there are unanswerable objections to any such course. We will refer to but a few of them.

An experimental farm we regard as an indispensable feature to the enterprise; but if an experimental farm must be attached to each of even four institutions, this item of expense alone would nearly if not quite equal all the expenses of an independent college.

But further, if the advantages of these several institutions were to be at all comparable with those in an independent institution, it would become necessary to maintain *in all*, twice the number of professors which would be required in one college, and still the advantages would not be equal. There would also be an additional expense in buildings, chemical apparatus and libraries adapted to the wants of the students. On the ground therefore of expense only, we are in favor of one independent college.

Another objection, which is not without its weight with your committee, consists in the fact that an agricultural department so attached would be but a secondary object, in comparison with the main design of the institution, and would not receive from the trustees that degree of attention which its high importance demands. It would not be the object for which the institution was founded, and would not probably enlist the warmest sympathies of its trustees and friends.

Being regarded too, rather as an *appendage* to an institution than the thing itself, and thrown into the back-ground in point of importance, it is very much to be feared that relations of perfect equality and friendliness might not always be preserved between those who pursued alone the classical departments, and those who daily pursued the science of practical agriculture by laboring on the farm with their own hands.

But perhaps a more serious objection than any yet referred to, may be found in the fact that far great advantages could be enjoyed at a single college than by agricultural departments attached to any number of institutions. The experimental farm, the library, the chemical apparatus, the stock of animals, the implements of farming, and all other appendages be on a broader scale, on each student would enjoy the benefit of the instructions of professors and teachers in every department within the range of their studies.

Your committee also feel that as the institution will be founded for the benefit of the paramount interest in the whole State, it should be

a State institution, established, governed, and in all things regulated by the people of this State.

For these reasons, thus briefly alluded to, and others which will readily present themselves, your committee have felt bound to recommend that no money should be appropriated for the establishment of agricultural departments in existing institutions, but that one independent institution should be founded and governed, and so far as necessary maintained by the State.

To carry out this great object, which seems to your committee one of the most desirable and important which can be presented to our attention, we herewith present a bill. The objects arrived at by its various provisions are too manifest to require an explanation in this report. We therefore conclude by earnestly commending the bill proposed, and this whole subject, to the most favorable and earnest consideration of this House.

All of which is most respectfully submitted.

&c., &c.

ON FLAX GROWING—The season is now advancing when Flax should be planted, I think it well to let the public know the result of my last year's crop. As far as I can inform them, I grew about twenty acres on my own farm, and took about twenty four acres more, the expense of tillage and harvesting the crop; was increased by the flax not being planted quite early enough, being obliged to do it in the midst of harvest. The cutting and tying cost 12s. and 14s. an acre, and I am paying 6d. per bushel for thrashing. The yield will be quite twenty bushels an acre. On a farm adjoining where an acre was planted, it was twenty two—on one more distant it was twenty four bushels. I have sold the seed for cattle feed at 6s. per bushel, and, when well cleaned at 6s. 6d. per bushel. I planted mostly Riga seed which yielded best, and is now the finest seed. I found great difficulty in separating the small seeds from the flax, but now with Gooch's winnowing machine I can do it effectually, and as the demand for sowing is so good in this country and in Ireland. I have reserved all I have for that purpose; I strongly advise its being sown the end of March; however, with light harrows, endeavouring to move the ground previous to sowing, to prevent the growth of annual weeds, I have not begun working up the fibre, but, from the dry spring the straw is short; but if it only realized £3, or £4 per acre, after all expenses, what grain crop will pay like it, seed and fibre included: the use of flax is being increased daily, and with the many millions we pay yearly for foreign flax we need not fear over-stocking the market.

—Mark Lane Express.

ALLUVIUM.—The name given to beds of mineral and other matters deposited and now depositing from water, chiefly at the mouths of rivers.

The surface of the earth in its natural condition is covered with the soil, which gardeners call virgin earth or vegetable mould. This is derived partly from the natural decay of the subjacent rock, assisted, according to Darwin—and there can be no doubt of it—by the castings of earth-worms, which are constantly sifting the finer from the coarser soil; and partly from the decay of plants which have grown upon it. It is generally of a very compound nature, consisting sometimes of all the earths and other metallic oxides, mingled with substances of animal as well as vegetable origin. This loam or vegetable mould is formed over the surface of all sorts of rocks—over every geological formation in fact—and it generally exhibits the prevailing character of the subsoil on which it rests, and is calcareous, silicious, or aluminous, according as the latter contains lime, much sand, or much clay. An alluvial soil, on the other hand, has no connection with the rocks below it: it has not been from *their* disintegration, but from that of rocks at a distance that it has been derived: it is a transported soil. Alluvial soils generally consist of all the mineral, vegetable, and animal substances which moving waters have gathered in their course through districts of various geology, and which, held in suspension, they have transferred from the higher to the lower ground, and deposited on becoming sluggish or still. The action of rivers is no doubt one principal cause of the formation of alluvial rivers: we see this operation proceeding now on the low lands at the mouths of large rivers near the sea; and when ever the influence of a constant tidal current setting along the coast is joined with that of a large river discharging its muddy contents, extensive deposits of earthy matters are now forming. The distinguishing structural characteristic of these deposits arises from the mode of their formation; this is not continuous, but intermittent: each tide leaves its contribution, to be somewhat indurated by exposures before the next shall be laid above it—the mass is thus made up of many thin layers, almost like the leaves of a book. The made of this deposit may be seen artificially exhibited in the progress of warping in Lincolnshire and Yorkshire, where the muddy tidal waters are imprisoned and literated in regular alternation; the mineral matters they hold in suspension settling during the intervals.

Alluvium may be formed of a clay mud, or of fine sand or silt, or of a mixture of both, and the layers of these two may alternate, according as winds vary and the sea currents from different quarters set in; this is particularly the case on the banks of the Humber. Clay is more

easily disintegrated than any other mineral, and therefore always occur abundantly in every alluvial soil; marly, and all the newer calcareous rocks as the oolites and chalk, are easily washed down, by the rains and carried off by rivers; sandstone and trap rock containing clay and lime, those granites also whose felspar, contains the alkaline silicates in abundance, are easily decomposed by the rain-water and other atmospheric agents, and all their finer ingredients are carried by the streams and rivers to the great deposits near the sea. Alluvial soils thus necessarily consist of minute or impalpable particles of a great variety of minerals; for though the predominating earth may in some be clay, in others lime, and in some sand, yet, derived as they are from all the geological formations which the river and its tributaries have traversed, they cannot fail of containing in due proportion every ordinary ingredient.

The extent of an alluvial deposit is proportioned to the range of the river inland, the bulk of waters, and their *spread* where in contact with the sea. When very extensive, so as to check the flow of the waters which have formed it, and cause their exit through many mouths, it is generally of a triangular form, widening towards the coast; it is then called the delta, but it exists in this form only at the mouths of large continental rivers. In our own country the formation is confined to marginal deposits along the banks of the rivers, or the sea. It occurs to the greatest extent on the east coast of the island; in the shores of the Wash, and at the mouth of the Humber, it forms districts of large extent. On both sides of the Thames, and of the Bristol channel also, there are considerable deposits. From Bridgewater inland, in Somersetshire, there is an extensive tract of alluvial land. In Scotland, on the banks of the Forth and of the Tay, there are considerable deposits, which receive the name of *carses*; and along the banks of other rivers in England, Scotland, and Ireland, the same formation occurs. These districts are, as we might expect from the constitution of their soil, among the most fertile in the country. Their agricultural value is greatest when the tidal and river floods mingle before the deposit takes place: the district is always the most extensive also under these conditions; and both circumstances are admirably illustrated in the following passage taken from an article on the Rural Industry of Holland, in the *Edinburgh Review* of October, 1847:—

“In the waters of the rivers, but especially in those of the sea, there exist vast numbers of minute microscopical animalcules, called by Ehrenberg infusorial animals, which are fitted to live, each class in its own special element only, and which therefore die in myriads when the sweet and salt waters mingle. It is almost

incredible to see how densely the water is sometimes peopled by these creatures, how rapidly they multiply, in what countless numbers they die. Their skeletons and envelopes, consisting of silicious and calcareous matters extracted from the matter, are almost imperishable. They commix with the mud of the river and come with it to form the deposits of slime that fill up the fertile land, which increases seaward where the waters are still. As the tide advances up its channel, the waters of the river spread and flow over the surface, so that far up the stream, where the upper waters are still sweet, the salt or blackish under current carries the living things which float in it to certain death, and leaves their bodies behind it to add to the accumulating mud. The extensive mutual surface of river and sea waters, which in this way are made to meet, involves a more rapid destruction of infusorial life than could in almost any other way be brought about. Experiment has shown that, as far up as the tide reaches, the so-called alluvial deposit, in and along the channel of the river, abounds with the remains of these marine animalcules; while above the reach of the tide none of them are to be found. In the Elbe they are seen as far as eighty miles above its mouth; about Cuxhaven and Gluckstadt, which are nearly forty miles from the open sea, these siliceous and calcareous skeletons form from one-fourth to one-third of the mass of the fresh mud, exclusive of the sand, while farther up the river they amount to about half of this quantity. In the Rhine, the Scheldt, the Mersey, the Liffey, the Thames, the Forth, the Humber, and the Wash, the same form of deposit goes on. So that in the mouths of the stated rivers there are to be superadded to the mechanical debris brought by the upper waters the more rich and fertilising animal spoils which the sea thus wonderfully incorporates with the growing deltas, and the banks of rising mud. And thus it is seen, that our islands generate upon the sea, not merely in proportion to the quantity of solid matter held in suspension by the descending waters, but in proportion also to the richness of the sea in microscopic forms of life, and to the volume of fresh water which the river can bring to mingle with it. Such is the origin of the alluvial soils of this country—properly so called—and of the sea bordering clays formed of mixed mineral and animal matters, the almost fabulous fertility of which tempts men every to brave disease and rapid death, and to expend unwearied toil in snatching them from their watery dominions, and defending them by high dykes.”

Frequent analysis of alluvial soils has sufficiently proved the extremely compound nature which the mode of their formation necessarily confers upon them. The various minerals, too, present in them, are accompanied in very con-

siderable proportion by the organic matter of animal, as well as vegetable origin, which the statements in the above quotations would lead us to expect. To this they owe much of their fertility.

As to the produce of these lands, about one half their extent in this country may be arable; the remainder being meadow and pasture land. They yield larger crops of grain, grass, and green crops, than any other soil in the kingdom. They may average in rental from £3 up to £5 per acre, and often let for sums still larger. The crops on them may, in ordinary seasons, vary from 30 to 50 bushels of wheat; from 40 to 70 bushels of beans; and from 70 to 80, upwards of oats. The grass crop, on the pastures may produce, on an average, upwards of 30 cwt. of hay. We know of districts on this soil, which, in the course of a summer, will graze a 100 stone ox, turning him out well fattened, besides three or four sheep per acre in addition.—*Cyclopedia of Agriculture.*

ECONOMY OF FODDER.

Every farmer should be careful of his fodder, and economise its use; during the winter, especially, very much is usually wasted; in straw more particularly is the extravagance observable. It will hereafter be wanted either as bedding for cattle, or, if other provender runs short, for cutting into chaff to mix with hay and other materials, in forming compounds in spring. Farm horses may be fed with straw cut fine and immersed in boiling linseed meal and water till all is absorbed, when it should be well mixed up. The straw thus becomes a good medium for conveying the linseed meal, the most fattening of all substances, into the stomach of the animal, and the effect produced is of the greatest advantage. The importance of a judicious mode of feeding is forcing itself upon the attention of farmers.

AUCTION SALE OF FRUIT TREES, &c.

THE undersigned is authorised by the Proprietor of ROSEBANK NURSERY to state, that, as early after the opening of the navigation in spring as possible, there will be a Sale by Auction, in this City, (similar to that which took place this fall) of Apple Trees, a fine assortment of suitable named sorts.

Pear, do	do	do	do.
Plum, do	do	do	do.
Cherry, do	do	do	do.

TOGETHER WITH

Raspberry Bushes, Strawberry Plants of fine named sorts, Roses, and various Ornamental Trees and Shrubs.

The healthy condition of these Trees and Plants, and the accuracy of their names, may be depended upon, and the sale will take place in good time for subsequent spring planting, which is the safest, at any rate, in all northern climates.

JOHN DOUGALL,
Montreal Witness Office,
Agent for Rosebank Nursery.

CANADIAN GLASS MANUFACTORY,
NEAR SNYDER'S LANDING, VAUDREUIL,
*Erected and carried on by Messrs. Boden
& Le Bert.*

THE Proprietors of this establishment are prepared to Manufacture **LOOKING GLASS PLATE** and **WINDOW GLASS**, of every size, coloured and fancy, according to patterns or orders. Shades for Oil and Gas Lamps, plain, tinted, or coloured, in the richest hues—Coloured Glass of any pattern for Churches, similar to those of European Churches; also, for Cottages, Gardens, Houses, and Steamers—Bottles and Vials for Druggists made to order.

—ALSO,—

SODA, GINGER, and ROOT BEER BOTTLES,
with or without the maker's name.

—AND,—

MILK CANS, of suitable sizes.

All these articles shall be of the very best quality and disposed of on reasonable terms; and the proprietors solicit a share of public patronage, and the examination of their Manufactures.

For orders or further particulars enquire of the proprietor, at the People's Hotel, No. 205 and 207, Notre Dame Street, Montreal.
Vaudreuil, January, 1850.

FARMING IMPLEMENTS.

WE, the undersigned, certify that we have carefully inspected a variety of Farming Implements manufactured by Mr. A. Fleck of St. Peter Street, and we feel great pleasure in recording our unqualified opinion that they are very much superior to any article of the kind which we have seen manufactured in the country, and equal to any imported.

And we would particularly recommend to the notice of Agriculturists throughout the Province his Subsoil Grubber, which he has improved upon from one which took a premium of £10 from the Highland Society of Scotland. This implement seems well adapted to improve and facilitate the labours of the Farmer, and we cannot doubt that it will soon be extensively used in improved cultivation. His Scotch and Drill Ploughs are also very superior, and well worthy of the inspection of every one desirous of possessing a valuable article.

M. J. HAYS, Cote St. Antoine,
President M. C. Agricultural Society.
P. P. LACHAPPELLE, Sault au Recollet.
WM. EVANS, Sec. L. C. Ag. Society.
JAMES SOMERVILLE, Lachine.
EDWARD QUINN, Long Point.
T. E. CAMPBELL, Major, Civil Secretary.
HUGH BRODIE, Cote St. Pierre.
P. F. MASSON, Vaudreuil.
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REAPING MACHINES.

THE Subscriber has on hand three **REAPING MACHINES** of the latest and most improved construction, capable of cutting *twenty-two acres per day*. Being manufactured by himself, he is prepared to warrant both material and workmanship as of the best order. Price moderate.

MATHEW MOODY, *Manufacturer.*

NEW SEED STORE.

THE Subscriber begs to acquaint his Friends and Customers that he has, under the patronage of the Lower Canada Agricultural Society,
OPENED HIS SEED STORE.

At No. 25, Notre Dame Street, Opposite the City Hall, Where he will keep an extensive assortment of **AGRICULTURAL** and **GARDEN SEEDS** and **PLANTS** of the best quality, which he will dispose of on as favourable terms as any person in the Trade. From his obtaining a large portion of his Seeds from Lawson & Sons, of Edinburgh, who are Seedsmen to the Highland and Agricultural Society of Scotland, he expects to be able to give general satisfaction to his Patrons and Customers. He has also made arrangements for the exhibition of samples of Grain, &c., for Members of the Society, on much the same principle as the Corn Exchanges in the British Isles. He has a large variety of Cabbage Plants, raised from French seed, which he will dispose of to Members of the Society, at one fourth less than to other customers.

GEORGE SHEPHERD.

Montreal, April, 1849.

NOTICE.—Some excellent Barley and Oats for sale, for seed, the produce of seed imported expressly last Spring from Britain—Samples to be seen at Mr. Shepherd's Seed Store.

Montreal, January, 1850.

Agents for the Agricultural Journal.

H. Aylmer, Esq.,.....Melbourne and Ship.
Capt. Stewart.....Clarenceville.
R. J. Robins, Esq.,.....Point à Cavignol.
Rev. F. Pilote.....College of St. Anne.
Dr. Grosbois, M. D.,.....Chambly.
Dr. J. H. R. Desjardins.....Green Island.
Dr. Conoquy.....St. Cesaire.
Dr. De la Brûnère.....St. Hyacinthe.
Mr. T. Dwyer.....St. Pauls, Abbotsford.
Paul Bertrand, Esq., N.P.,.....St. Matthias.
Thos. Cary, Esq., (Mercury).....Quebec.
Dr. Smallwood.....St. Martin, Isle Jesus.
Robt. Ritchie, Esq.,.....Bytown.
Major Barron.....Lachute.
L. Guillet, Esq.,.....Three Rivers.
Hon. F. A. Malhiot.....Verchères.
J. B. E. Durocher, Esq.,.....St. Charles, Chambly.
A. C. Cartier, N. P.,.....St. Antoine.
John M'Larren, Esq.,.....Murray Bay, Sag.

All communications connected with this Journal to be addressed, post paid, to the Secretary of the Society—WILLIAM EVANS, Montreal.

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AGRICULTURAL JOURNAL, AND TRANSACTIONS

OF THE

Lower Canada Agricultural Society.

VOL. 2.

MONTREAL, MAY, 1850.

NO. 3.

We have received a communication from a respected correspondent, A. B. C., to which we would beg to direct attention. The suggestions of this gentleman are the more valuable, because we know that agriculture has not a more steady friend and supporter in Lower Canada. We look most anxiously to the next Session of the Provincial Parliament, in the hope that the agriculture of Canada—the first, and principal interest of the country—will receive all the attention that is due to such an important interest. The suggestions of our correspondent are not to be lightly passed over. As we already observed, there is no interest in the country that deserves more the attention of our Legislature, to do all that can be done to promote its improvement and prosperity, and thus secure prosperity to all interests in the Province. It is not alone by premiums at Cattle Shows, that what is necessary to the improvement of husbandry is to be effected, but by providing the means of communicating general and practical instruction in an improved system of agriculture, by Agricultural Colleges and Schools, Model Farms, suitable books for the use of country Common Schools, and by the general diffusion of useful information, and suggestions by agricultural periodicals. In addition to all these, Agricultural superintendence would be necessary, as proposed by our correspondent. All this cannot be accomplished without expences, but as it must be our agriculture that supplies the means of Revenue chiefly, if there is a loan made to her, it will only be to increase the means of future Reve-

nue. This proposition may be questioned by parties, but we are confident we are able to maintain its perfect correctness. Despise agriculture who may, but we are certain there is no hope for prosperity to Canada, except through her agriculture first of all; that, and that alone, must be the basis. Canals and Rail-roads are great advantages, but their principal use and benefit will be to transport the products of a prosperous agriculture. They need not be constructed unless for that purpose, and they could not be maintained by any other means. Parties may fancy our views to be quite erroneous, but if they can show them to be so we shall acknowledge our error. There cannot be any mistake as to the proposition we advance, as we make it clearly and distinctly, "That it is the productions of the soil of Canada that can alone secure a good and sufficient Revenue, and prosperity to every class and interest in the country."

To the Editor of the AGRICULTURAL JOURNAL.

"No direct aid has been given by the General Government to the improvement of agriculture, except by the expenditure of small sums for the collection and publication of agricultural statistics, and for some chemical analyses. This aid is, in my opinion, wholly inadequate. To give to this leading branch of American industry the encouragement which it merits, I respectfully recommend the establishment of an Agricultural Bureau, to be connected with the Department of the Interior. To elevate the social condition of the agriculturist, to increase his prosperity, and to extend his means of usefulness to his country, by multiplying his sources of information, should be the study of every statesman, and a primary object with every legislator."—*Extract from the Message of President Taylor, U. S.*

SIR,—You have already submitted to your readers the very important suggestions of the

above extract from the Message of President Taylor; but, as good counsels are apt to be soon forgotten, I take the liberty of again calling their attention to the same important topic.

The so-called doctrine of annexation recently promulgated, has naturally directed our attention to the sayings and doings—be they for good or for evil—of our Republican neighbours. These words of the chief magistrate of the great Republic, merit the most serious attention of every man having the real interests of his country sincerely at heart.

Agriculture, so important a branch of American industry, has not hitherto been directly represented in any of the principal government departments; hence, the President recommends the utility of immediately establishing an Agricultural Bureau. Nothing impedes the "Annexation" of Canada to so useful a reform, and certain I am that every true friend of Canada will cheerfully "annex" and co-operate in carrying it out. In the true sense of the term, Canada is even a more agricultural country than the United States. Why, then, should not agriculture have its representative in our great public departments?

We have Attorneys General, Solicitors General, a Receiver General, an Inspector General, Adjutant General, Commissioners of Public Works and Crown Lands; and why should we not have an Agricultural Minister?

Are judicial formulas, Public Works, Crown Lands, or Militia Statistics, of higher consideration, of greater importance to the inhabitants of Canada, than the interests of agriculture? This is an hypothesis which none, I presume, will venture to advance.

Have not Prussia, France and Belgium their Agricultural Ministers?

Perhaps it may be alleged, that our administrative machinery is already sufficiently cumbersome and complicated without the inconvenience of an additional cog. But I should reply, that we can easily have an Agricultural Minister without either complexity or inconvenience—whose office may be in connexion with or attached to that of the Public Works or Crown Lands.

To discharge its duties properly, and in a

manner commensurate with so momentous an institution, this office would be no sinecure.

To prepare agricultural statistics, to encourage the establishment of model-farms and agricultural societies in every county, to receive annual reports and embody the same in one general report to be submitted to the Legislature, to foster and promote home manufactures—so far as to fabricate for our own markets articles, the produce of the soil, viz: Iron, Glass, Paper, Flax, Wool, Leather, &c., which are now sold—in a raw state—to foreign manufacturers by whom they are returned to us when prepared for use, and disposed of at an immense profit—to advocate the home manufacture of these productions by calling on the administration for sufficient protection in the regulations of the tariff. Such are the points to which the attention of the new minister would necessarily be directed.

The establishment of such a Bureau would, furthermore, have a moral effect on the mind of the cultivator; his interests being directly represented in high quarters, he would naturally entertain a more exalted idea of his position in society, and consequently become more attached to his condition of agriculturist. The young man, on quitting school or college, would not then despise the parental plough; nor would he barter his inheritance for the tapster's spigot, or the mercer's yard-stick. He would not then abandon his aged parents, to immure himself behind the counter in some of our commercial cities—to the risk of his time, his health, his repose—and what is infinitely more valuable.

A. B. C.

March 27th, 1850.

We have constantly advocated the expediency of improving a native breed of neat cattle, rather than introducing a new breed altogether, whose suitableness to every situation and circumstance had not been proved. The present breed of Ayrshire cattle are in very good repute as regards their suitableness for the dairy, and we have heard of a cow of that breed, not supposed to weigh over 400 lbs. sold for £50, and obtaining a first prize at a cattle show, in the class of milch cows. The native breed of

Ayrshire, previous to their being crossed and improved by other breeds, are described by very good authority, Mr. Wm. Aiton, of Strathaven, Scotland, as "being nearly all of a black colour, not weighing, when fat, over 300 lbs. of saleable meat—that they were driven round their bare leys in summer, with horses, sheep, and young cattle, and getting no other food in winter but a scanty supply of oat-straw, with what they could collect on the fields, they had the aspect of starvelings—their hair coarse, and standing up, their skin thick, and adhering to their bones: their bones large, bodies lank; few of them yielding more than two, or at most three Scotch pints of milk per day. This starveling breed of cows in Ayrshire, in the course of the last forty years (this was written in 1812) has been gradually, and as it were imperceptibly, changed into something very different in point of size, shape, quality, and general aspect. But though an eye-witness to the progress of that important change, and recently having made all possible inquiry, I am not able to account for it otherwise than by greater attention to crossing, rearing, and feeding. Some have alleged the dairy breed of Ayrshire have come from Holland, and others have ascribed to them an English origin. I have no doubt but a tinge of foreign blood may have come into their veins: but I am confident that the breed is chiefly indigenous, and that the principal improvement upon that breed was effected by better feeding and treatment. The Earl of Marchmont, about the year 1750, purchased from the Bishop of Durham, several cows and a bull, of Teeswater or some other English breed, of the *same brown colour*, into which the dairy stock of Ayrshire has since been changed. These were crossed with the stock of many farmers. They were of greater size than the native breeds of Scotland; and some of these having, from time to time, been carried into different parts of the county of Ayr, and being generally placed on richer pasture, and better fed than the ordinary farm

stock were at the time, they yielded a greater quantity of milk, and the farmers became eager to procure calves or crosses with them, in hope of getting similar returns from their progeny. I have not been fully satisfied as to the origin of this stranger breed; they were termed Dutch cows by some, and English cows by others. But from whatever quarter they may have come, it is from them that the brown colour, now so universal, in the Ayrshire dairy breed, has become so fashionable. Perhaps something of the other qualities of the breed may have also descended to the Ayrshire dairy cows by crossing with them. But I am not of opinion that the present stock of Ayrshire are either completely descended, or that their superior excellence has been entirely derived from these strangers. I am persuaded that they have been brought to their improved state, chiefly by better feeding and treatment. As the dairy has been the great boast of Cunningham, (the northern district of Ayrshire,) from time immemorial, the inhabitants could not fail to discover, that some of their cows yielded more milk than others. When one excelled in milking, they would look well for others of the *same shape*, and aspect, and *reject* those that were different. They would naturally rear the calves of the best milkers, in hopes of their inheriting the qualities of their dams. This, and better feeding would improve their stock, and the success would stimulate them to make still greater exertions to render their cattle better and more productive; such improvements once begun on sound principles, could not fail to lead to the most beneficial result. To procure more milk, they select the cows that they find to be most productive of milk, and gradually better her condition. By these means the stock is improved, and by experience and observation the farmers acquire more correct notions of the breed, and in what manner they can be rendered still more productive. It has been greatly more by these means, than by importing a foreign breed, that the dairy

stock of Ayrshire have attained their present unrivalled celebrity, and the farmers having become familiar with the pliancy of the animal, and the proper means of improving, and rendering it productive, they will no doubt persevere in making still greater improvements.

“The shapes most approved in the dairy breed, are as follows:—*Head* small, but rather long and narrow at the muzzle; the eye small, but quick and lively; the *horns* small, clear, bended, and their roots at a considerable distance from each other; *neck* long and slender, tapering towards the head, with little loose skin hanging below; *shoulders* thin; *fore-quarters* light and thin; *hind-quarters* large and capacious, *back* straight, broad behind, the joints of the chine rather loose and open; *carcase* deep, and the *pelvis* capacious and wide over the hips, with fleshy buttocks; *tail* long and small; *legs* small and short, with firm joints; *udder* capacious, broad and square, stretching forward, and neither fleshy, low-hung nor loose; the *milk* veins large and prominent; *teats* short, pointing outwards, and at considerable distance from each other; *skin* thin and loose; *hair* soft and woolly; the *head, bones, horns, and all parts of the least value*, small, and the general figure compact and well proportioned.” Who that has any experience of dairy cows, that will not admit the correctness of the above description of a good dairy cow?

Mr. Aiton goes on to say:—“The *qualities* of a dairy cow are of still greater importance than her shape. Firmness and docility of temper greatly enhance the value of a milch cow, one that is quiet and contented, feeds at her ease, does not break over fences, or injure other cattle, so much as those that are of a turbulent cast. To render them docile, they ought to be gently treated, frequently handled when young, and never hunted with dogs, beaten or frightened; a moderate degree of hardness, life and spirits, with a sound constitution, are desirable qualities in dairy stock, and all these are found in the Ayrshire. Some have mentioned it as a valuable quality, when a cow subsists on a small portion of food, but this will depend on the quantity of milk which one so fed will yield. If a cow gives much milk on a little food, it is one of the best qualities she can possess, but of this I entertain doubts, which forty years’ experience, enquiry and observation, have

served to corroborate and confirm. I have heard it asserted, that some cows will yield as much milk, and fatten as fast, when fed on coarse, as others will on rich food, but I never met with, nor do I ever expect to see such cows. The old adage so common in Ayrshire, that ‘a cow gives her milk by the mow,’ has always held good, so far as I could perceive. It is of the greatest importance for dairy cows to be fed from their earliest days on food that has a tendency to produce the milky secretions, and even to be fed on that description of food when they are not giving milk. It was common in former times to rear young cows for the dairy, on moors and on heathy ground, and only to lay them on better pastures and dairy food when they came into milk, but this has been found to be an improper mode of raising a dairy stock, and they now fare much better in their youth than they did in former times; when young cows of the dairy breed are reared on moors, or bad pastures, and get only as much fodder as keeps them alive, they grow up what in Ayrshire is termed a *rough beast*, with large horns, coarse hair, thick skin, high bones, and other marks of a starveling, and they *never after become good milkers*. But when they are fed on better pasture, and provided with some green food, and good fodder during the winter, they grow up proper dairy cows, having the shapes and good qualities that have been enumerated. In former times, no other attention was paid to the dairy stock during the winter, but what was necessary to keep them alive. They were fed on the worst and coarsest of oat-straw, or ill preserved bog hay, cut from the marsh meadows, and frequently half rotted in drying. The consequences were that the dairy cows went out to grass in May, mere ghosts, lean, weak, and meagre; with their milk vessels dried up. Hence the summer was far advanced before the cows either gave much milk, or that which was of good quality. A lean starved cow never gives so much or so good milk, as one that is in proper habit of body.

“Even young cows intended for the dairy ought to be fed from the time they are calves, on food suitable for milch cows, and treated nearly as their dams. Such food and treatment have the greatest tendency to form the vessels of the young cows, and rear them with dairy qualities, and when they come into milk after being so formed they will produce the most

copious secretions of the milky fluid. It is by such treatment that a calf is formed into a dairy cow, and those who wish to rear and keep a dairy breed, in any thing like perfection, must provide them with abundance of such food as is suited to the production of milk, and they must supply them with food at all periods of their existence, when they are young, when they are full grown, when they are in milk, and when they are dry."

We have copied the foregoing remarks, as well worthy the attention of Canadian farmers. The native breed of cattle in Ayrshire, (from Mr. Aiton's description, before they were improved, by crossing, selection, and better feeding,) were inferior to the Canadian breed of cattle, and the latter might be improved by the same means that brought the former to so much perfection. The modes of improvement described by Mr. Aiton, as having been adopted in Ayrshire, we have constantly recommended for the last 25 years, as the most suitable for the due improvement of native Canadian cattle. It is from the same cause that the Ayrshire cattle were formerly so worthless, that the Canadian cattle are so unprofitable now. We have not the smallest doubt, that the latter are as susceptible of improvement, by adopting the proper means, as the former starvelings of Ayrshire were. Experience and common sense would point out to us how we were to improve domestic animals, to make them more suitable, and profitable for our use. Formerly, the cattle of Ayrshire were pastured and fed exactly as the cattle of Canada are generally at the present day, when a good system of husbandry was not adopted, and with the same results, namely—an inferior stock of cattle, and a very short produce from them. We may find fault with our general stock of cattle, but we are convinced, it is the fault of their owners, more than any inferiority in the breed, that makes them inferior and profitless. The most profitable dairy cows we ever had, were pure Canadian breed, purchased when young. It is by superior keep, and judicious

selection, that any breed of cattle can be most certainly improved, and made profitable; and the best breeds on earth cannot be made profitable, or maintained in perfection, unless they are fed properly, and all possible attention given to selection and breeding. It is by such means alone that superior breeds of cattle and sheep have been obtained, and it is by such means alone they can be preserved.

SPECIAL MANURES AND THIN SEEDING.

The following experiment, though made on a very small scale, was conducted with so much accuracy that it may interest your readers. The object of this and some other experiments made by me last year was to try the possibility of growing plants on soils totally unsuited to them, by means of special manures and culture; the one I am about to detail on *Wheat* tested also the results of thin seeding.

The Soil.—In what had once been a peat bog, I found a heap of dry peat mould about three feet deep, but without a blade of grass or a weed growing on it. This I fixed on as the worst possible soil for wheat, and levelled a patch six feet square for the experiment: an imperial acre contains 1,210 such portions.

The Manure consists of calcined bones dissolved in sulphuric acid, to which was added a soluble silicate of soda made from common salt, the whole being dried with some lime and peat ashes. The cost of the manure was estimated at 44 or 45 shillings per acre.

For Seed, in order to give no undue advantage by selection, I took a handful from a heap of wheat prepared for market. I dropped from my hand an exact half ounce into a scale, which I counted, and found to contain 349 grains; I separated these into parts; and one of them made up to 175 grains, was the seed used, without any selection or picking or preparation whatever.

Culture.—I opened 7 drills in the plot, 6 feet long, 3 inches deep, and 10½ inches from middle to middle; in these drills, in the beginning of November, 1848, I spread the manure, equally divided, and over it the seed, 25 grains being deposited in each drill by single grains at 3 inches apart (being at the rate of less than 19 lbs per acre) and all carefully covered 3 inches deep.

For the sake of comparison my experimental portion was surrounded by a drill, in which the wheat was sown in the peat mould without any manure, and this part of the experiment may be dismissed at once with the following observations:—The seed germinated in about the same

proportion as in the the manured part, and kept tolerable pace with it during the winter; but it did not tiller at all; the stalks were slight and weak, and bore flowers, but at harvest when we came to examine them, in no one head of the unmanured portion could we find a single grain of wheat of the size of a pin's head—showing clearly how utterly unfit the soil was for the crop sown on it. I ought to add, that in the month of May I tried to revive and force on some of these weak stalks by watering them with Peruvian guano, at the rate of 4 cwt. to the acre; but though its effects were visible in giving green colour to the straw, it did not produce either tillering or corn.

After Cultivation.—At the end of April, and again when the plants were coming into ear, I hoed the intervals between the first three rows, gathering the mould about the plants as directed by *Thaer*, in what I believe to be the ablest work ever published on both practical and scientific farming; and the effect of the first hoeing on the growth of the plants was such, that a stranger who accompanied me about a week after the hoeing, enquired if the one part of the bed had received a much larger portion of the manure than the other. It also produces a very decided effect in the tillering as may be gathered from the following statement of the number of seeds that germinated in each drill out of 25 seeds sown therein; and the number of tillerings:—

Seeds that germinated.....17-20-17-20-20-18-17
Tillerings in same.....95-92-70-78-67-60-61

Summary.—175 seeds sown, 129 grew, which produced 533 stalks—the three rows hoed and half the middle row which got a half hoeing produced 296 stalks, while half the middle and three unhoed rows produced only 227 stalks. At the end of August we reaped a pretty sheaf, with, I think, the heaviest head I ever felt. The straw weighed 5lbs. 10 oz., being 3 tons 9 p. per acre; the grain, carefully hand-picked, weighed 3 lb 6½ oz., being 412½ lbs. per acre or at 60 lbs. per bushel, 68 bushels, or 8½ quarters.—D.S.P.A.

We would direct attention to the above Experiment, showing as it does how a soil totally unfit for wheat, may, by the application of suitable manure, be made to produce a very large crop of that grain.

HORSES.

Grain is generally the principal food of horses: most persons give the preference to oats. But when any other kind of grain is substituted for oats in quantity proportioned to its nutritive

power, and mixed with straw of finer quality and greater quantity than usual, the most attentive observers are unable to discover the slightest difference. Rye is the grain most generally substituted for oats. The use of unground barley is disapproved of by some persons, because they say a large portion of it passes through the body undigested: others, on the contrary, strongly recommended its use. Wheat is rarely used as food for horses; some persons who have been obliged to resort to it have found it very injurious, but various reasons induce me to believe that the evil entirely arose from not having mixed the wheat with a proper quantity of cut straw; without this addition it is very apt to clog the stomach. At one time when this kind of grain was very cheap as compared with others, I gave it to my horses with very good effect, but always mixed with a considerable quantity of cut straw.

The food of a horse is usually measured in oats, this being the most usual food. There is however no kind of food which varies so much in nutritive power as oats given by measure. Many persons have therefore very judiciously resorted to the expedient of giving their oats by weight, or at least modifying the quantity according to this method. Of some kinds of oats the scheffel weighs but 36 lbs, while of others it amounts to 54 lbs; in such a case the light oats will not fully supply the place of the heavier even if the quantity be regulated by weight; nine metzen of the former are not equivalent to six metzen of the latter, because a given weight of the former contains more husk and less farina. Ten metzen of the 36 lb. variety would probably be required to supply the place of eight metzen of the 54 lb. Taking the 48 lb. oats, which may be considered very good, as the basis of the calculation, we may reckon three metzen or 9 lbs. for a horse of average size, employed in ordinary work, it is understood, however, that the same horse have 8 lbs. of hay; with such food horses of this description usually keep up their strength very well; but when they are put to extraordinary work, it is proper to give them an additional quantity of food. Smaller horses, which are not put to forced labour seldom have more than two metzen even of light oats. The larger horses of Saxony, Westphalia, Bavaria, and Austria, are supplied with at least four metzen, and sometimes five. Waggon horses frequently have eight metzen, especially when but little hay and no cut straw is given to them. The difference of three and five metzen—the former for small, the latter for large horses, is often made without producing any great difference in the size and strength of the animals, or the manner in which they perform their ordinary work. Horses of the smaller races are therefore, preferable, where they are not continually wanted to draw heavy loads, especially since,

even in the latter case, the work may be performed by increasing the number of horses employed.

Rye, which is most frequently used as a substitute for oats, produces the same effect when given in half the quantity of the latter by measure, or still better by weight; some persons reckon the proportion of rye to oats for feeding horses only as 7 to 12; they admit, however, that their horses thrive better on the former than on the latter.

The seed of pulse, such as peas, beans and tares, the last of which is considered the best for horses is not reckoned of greater value than rye. They are however decidedly more substantial, as appears from the observations already made on their nutritive properties; and likewise, from the testimony of those who are acquainted with this mode of feeding. In many countries these pulse constitute almost the sole nourishment of horses; they do not as some persons assert, disorder the respiration of the animal. The English give them without reserve to their race horses. The prejudice in favor of oats in preference to all other kinds of grain chiefly arises from this cause, that all diseases which may attack horses fed upon oats, in a country where this mode of feeding is not customary, are imputed to the oats, and the matter is talked of for years, whereas, if the same disease had attacked horses habitually fed upon this kind of grain, some other cause would have been sought for and discovered. It is certain, however, that very substantial food should be cautiously given or it will be likely to bring on indigestion. For example, mischief may easily occur when servants in the midst of the heavy harvest work, secretly put aside a certain number of sheaves of new rye, and given them to the horses without measuring the quantity, and yet many farmers who are perfectly aware of this trick shut their eyes to it, and regard it as a kind of established custom. Grain of the more substantial kinds likewise requires to be mixed with more or less of finely cut straw: with oats, this is not absolutely necessary though always useful. To prevent the horses from blowing away the chaff, and separating the grain from it, the mixture should be wetted. This wet fodder, though it can never do any injury when cautiously given, will be likely to act as a cause of disorder, if the horses are heated and eat it with avidity, an occurrence which will not unfrequently happen, especially when they have been taken to the field before they have finished their meal, and find the rest of it in the manger on their return. There are many reasons for never leaving moist food in the mangers.

Grain given to horses should not have undergone fermentation: it should be dry but not heated; in some seasons badly gathered and heated oats occasion fatal epidemics among

horses. Sprouted grain does not injure them provided it has been housed in a perfectly dry state, and has not contracted a smell of fermentation. Malted grain, particularly barley, mixed with the food, is considered very beneficial to horses, especially when given in the proportion of a third of the total quantity.

Some persons have effected great saving by having their corn crushed before giving it to the horses, for without this preparation a great part of it passes unchanged through the body. This may easily be done if we have a mill at our disposal, but there will then be still greater necessity for mixing the corn with cut straw.

The grain must always be sifted to remove the dust, unless it has been subjected to the more effectual process of fanning a short time before.

Most horses are fed upon hay in addition to their corn, and some have nothing else.

It is certain that hay may be substituted for corn feeding, but opinions are divided respecting the extent to which this substitution ought to be carried, and likewise with regard to its economical expediency; in fact it is impossible to lay down any general rule on the subject. Eight pounds of hay are generally regarded as equivalent to a metzen of oats, and when estimated by weight, hay is said to bear to oats the ratio of eight to three. Very nutritious hay grown on low meadows, or fodder made from clover, lucerne, on sainfoin, is undoubtedly more substantial, and may be estimated in the proportion of seven to three, whereas the same kinds of fodder, when coarse and poor, do not exceed the ratio of nine to three. But generally speaking it is found that when the quantity of hay is increased and that of corn diminished, the horses gain more flesh, and are better able to perform slow work, but do not stand long journeys or great exertion so well. If, on the contrary, the hay is diminished and corn increased in quantity, the horses grow lean, but become stronger and more lively: provided, however, that their supply of straw is increased. An increase in the quantity of the one or other kind of food will be found advantageous according to the particular circumstances in which we may be placed, and the prices of various kinds of fodder.

Besides the cut straw, other straw is likewise given to horses, particularly that which has been most broken; in thrashing this is put into the rack. Contrary to general opinion, wheat-straw is the best: it is the most proper substitute for hay when that kind of fodder is deficient, and is likewise the kind of straw which horses eat most willingly. The haulm of tares, lentals and beans are doubtless still more nutritious, especially, when part of their leaves are left on them in the green state. Some farmers are afraid to give pea-straw, they say that it sometimes

brings on colic: but this opinion is founded on mere prejudice.

Opinions are divided respecting the propriety of feeding horses in the stable on clover, and other kinds of green meat. For my own part I am persuaded that horses may be kept in this manner in good health and full vigor, at least when a proper system is pursued. It is, however, the quantity of this fodder, and the price current of grain, which determine the amount of saving that may be obtained by this mode of feeding. I kept my horses in this way for several years, when corn was high-priced, and always with advantage; they improved in condition, without losing strength, even when they are not spared in respect of work. In the following winter also they were in suprisingly good condition. The transition from dry to green fodder must however be gradually made. At first the clover must be cut up with straw, and first one portion of it then two given daily in place of oats: afterwards when the clover is in flower, it is given to them in as great a quantity as they like, but then the corn is stopped. It is not good to give corn with green meat, because the former then passes through the body undigested. If corn and green feeding are to be united, the corn must then be given in the morning and the horses not allowed any green fodder before noon, or any corn in the after part of the day. Green lucerne and tares (especially the latter,) which have begun to form their pods, are better for horses than clover. The same gradual change must be observed in passing from green to dry feeding.

Horses are sometimes turned out to grass in summer either with other cattle or in fields by themselves. If they are properly attended to and left completely at rest, this removal to their natural state agrees with them perfectly well. But horses cannot be often left unemployed, and therefore it is rarely possible to have them turned out to grass. For a horse to thrive when fed in this manner, the pasturage must be abundant, but he will then spoil a great deal of it with his feet, hence two cow pastures are reckoned for one horse pasture.—*Thaer's Principles of Agriculture.*

With respect to the dung proceeding from the fodder consumed by cattle, and the straw or other substances composing the litter, no difference is made, in general estimates, between the various kinds or breeds of cattle by which it has been produced. We shall, however, offer a few observations on this subject.

The amount of dung which will be produced from the same quantity of food by lean, ill conditioned, weakly cattle, will neither be so great, so rich, nor so fertilizing; nor does it contain so

much animal matter as that which is produced by strong, healthy and well fed animals.

Sheep, if fed on the same quantity of provender, will produce dung which goes further, but the action of which is not so durable. These animals appear, however, to be decidedly the most advantageous for the manuring of pasture land; the dung which they evacuate over the meadows is not only more equally diffused, but also amalgamates more freely with the soil, and acts more promptly on the vegetation. If the sheep are brought up from the pastures at night, and confined in a paddock or sheep-fold, they will produce a proportionally larger quantity of manure than cattle, supposing that each species has been allowed the same extent of pasturage. This reason causes the meadow and pasture-lands in England, where it is customary to leave the sheep out night and day, gradually to become ameliorated and improved, and to be capable of feeding an increased number of these animals every year, when these lands are broken or ploughed up they are found to have a much greater proportion of nutritive matter than those on which cows have been fed; indeed these latter usually decrease in fertility about the third or fourth year, particularly where the soil is of a dry hot nature.

When sheep are depastured it is usually reckoned that 1,200 will yield about the same degree of amelioration to an acre of land in 24 hours as would be produced by one half of the quantity of stable manure generally allowed; 1,800 sheep are supposed to manure an acre and a half tolerably well, and 2,400 to manure it abundantly, so much so indeed as to render it too rich for most kinds of grain; if ten sheep when pastured are regarded as equivalent to one cow, and if one cow produces 15 lbs. of dung during the night, 180 cows will only produce, 2,700 lbs. and 240 cows 3,600 lbs. which is not enough to manure one acre of land, but the effects and the nutritive properties of manure thus derived are much more permanent, and are retained much longer in the soil than the dung of sheep.—*Ib.*

ON CHEESE MAKING.

CHESHIRE CHEESE.

That of Cheshire, as described in Holland's Survey, is generally made with two meals of milk; and that, even in dairies where two cheeses are made in a day: indeed, in the beginning and end of the season, three, four, and even five or six meals are kept for the same cheese. The general custom is, to take about a pint of cream, when two-meal cheeses are made, from the night's milk of twenty cows. In order to make cheese of the best quality, and in the greatest abundance, it is, however, admitted that the cream should remain in the milk; for whether the cream that is once sepa-

rated from it, can by any other means be again so intimately united with it as not to undergo a decomposition in the after process, admits of some doubt. The more common practice is, however, to set the evening's milk apart till the following morning, when the cream is skimmed off, and three or four gallons of the milk are poured into a brass pan, which is immediately placed in the furnace of hot water and made scalding hot; then half of the milk thus heated is poured upon the night's milk, and the other half is mixed with the cream, which is thus liquified, so as, when put into the cheese-tub, to form one uniform fluid. This is done by the dairy-woman while the other servants are milking the cows, and the morning's milk being then immediately added to that of the evening, the whole mass is at once set together for cheese.

The rennet and colouring* being then put into the tub, the whole is well stirred together; a wooden cover is put over the tub, and over that is thrown a linen cloth. The usual time of "coming," or curdling, is one hour and a half, during which time it is frequently to be examined. If the cream rises to the surface before the coming takes place, as it often does, the whole must be stirred together so as to mix again the milk and the cream; and this, as often as it rises, until the coagulation commences. If the dairy-woman supposes the milk to have been accidentally put together cooler than she intended, or that its coolness is the cause of its not coming, hot water, or hot milk, may be poured into it, or hot water in a brass pan may be partially immersed in it. This must, however, be done before it is at all coagulated, for the forming of the curd must not be tampered with. If it has been set together too hot, the opposite means, under the same precautions, may be resorted to; but the more general practice is, to suffer the process to proceed, hot as it is, until the first quantity of whey is taken off, a part of which, being set to cool, is then returned into the tub to cool the curd. If too little appears to have been used, it renders the curd exceedingly tender, and therefore an additional quantity may be put in; but this must be done before the coagulation takes place, for, if added afterwards, it will be of little effect, as it cannot be used without disturbing the curd, which can then only acquire a proper degree of toughness, by having some heated whey poured over it.

Within an hour and a half, as already mentioned, if all goes on well, the coagulation will be formed—a point which is determined by gently pressing the surface of the milk with the back of the hand; but in this test experience is the only guide, for the firmness of the curd, if the milk be set hot together, will be much greater than that from milk which has been set cold together. If the curd be firm,

the usual practice is to take a common case-knife, and make incisions across it to the full depth of the blade, at the distance of about one inch, and again crosswise in the same manner, the incisions intersecting each other at right angles. The cheese-maker and two assistants then proceed to break the curd, by repeatedly putting their hands down into the tub, and breaking every part of it as small as possible, this part of the business being continued until the whole is uniformly broken small: it generally takes up about forty minutes and the curd is then left, covered over with a cloth, for about half an hour, to subside.

The bottom of the tub is now set rather atilt, the curd is collected to the upper side of it, and a board is introduced, of a semicircular form, to fit loosely one-half of the tub's bottom. This board is placed on the curd, and a 60 lb. weight upon it, to press out the whey, which, draining to the lower side of the tilted tub, is ladled out into brass pans. Such parts of the curd as are pressed from under the board, are cut off with a knife, placed under the weighted board, and again pressed, the operation being repeated again and again until the whey is entirely drawn from the curd. The whole mass of curd is then turned upside down, and put on the other side of the tub, to be pressed as before. The board and weight being removed, the curd is afterwards cut into pieces of about eight or nine inches square, piled upon each other, and pressed both with the weight and hand, these several operations being repeatedly performed as long as any whey appears to remain in it.

The next thing is to cut the curd into three nearly equal portions, one of which is taken into a brass pan, and is there by two women broken extremely fine; a large handful of salt being added, and well mixed with it. That portion of curd being sufficiently broken, is put into a cheese-vat, which is placed to receive it, on a cheese-ladder over the cheese tub, the vat being furnished with a coarse cheese-cloth. The second and third portions of the curd are treated in the same manner, and emptied into the vat; except that into the middle portion eight, nine, or ten times the quantity of salt is usually put. By some dairy-women, however, each portion is salted alike, and with no more than three large handfuls to each. The break-

* Spanish annatto is the drug usually employed: little more than the quarter of an ounce of which is sufficient for a cheese of 60 lbs. Other colouring matters are, however, used, such as maryl gold boiled in milk, which gives a pleasant flavour; and carrots also boiled in milk and strained, which impart a rich colour, but rather strong taste. The annatto is generally put in by rubbing a piece of it in a bowl with some warm milk, which is afterwards allowed to stand a little in order to drain off the sediment, and is then mixed with the entire quantity.

It takes up more or less time, as the cheese was set together hotter or colder; half an hour is, perhaps, the longest time.

The curd, when put into the cheese-vat in its broken state, is heaped above the vat in a conical form: to prevent it from crumbling down, the four corners of the cheese-cloth are turned up over it, and three women, placing their hands against the conical part, gently, but forcibly, press it together, constantly shifting their hands when any portion of the curd is starting from the mass, and folding down the cloth upon it. So soon as the curd adheres together so as to admit of it, a small square board, with a corner of the cloth under it, is put on the top with a 60lb. weight; or a lever such as that previously described is pressed upon it. Several iron skewers are at the same time stuck in the cone, as well as through holes in the side of the vat, from which they are occasionally drawn out and fixed in other spots, until not a drop of whey is discharged. The weight and skewers are then removed, and the corners of the cloth are either held up by a woman or by a wooden hoop, while the curd is broken as small as possible, half way to the bottom of the vat; and the same operation of pressing and skewering is repeated. The women then take up the four corners of the cloth while the vat is drawn away and rinsed in warm whey; a clean cloth is then put over the upper part of the curd, and it is returned inverted into the vat. It is then broken half way through in the same manner as before, which several operations occupy from three to four hours.

When no more whey can be extracted by these means from the cheese, it is again turned in the vat, and rinsed as before in warm whey. The cloth now made use of is finer and larger than the former, and is so laid, that on one side it shall be level with the edge of the vat, and on the other wrap over the whole surface of the cheese; the edges being put within the vat, thus perfectly enclosing the entire mass. In this stage of the business the cheese is still higher than the edge of the vat; and to preserve it in the due form, recourse is had to a binder about three inches broad, either as a hoop or as a cheese-fillet, which is a strong, broad, coarse sort of tape, which is put round the cheese, on the outside of the cloth, and the lower edge of the binder pressed down within the vat, so low as that the upper edge of it may be level with the surface. The cheese is then carried to the press, and a smooth, strong board being placed over it, the press is gently let down upon it, the usual power of which is about 14 or 15 cwt. In most dairies, however, there are two presses, and in many three or four of different weights; the cheese being by some put first

under the heaviest, and by others under the lightest.

As soon as the cheese is put into the press, it is immediately well skewered—the skewers being of strong wire eighteen or twenty inches long, sharp at the points and broad at the other end; the vat and binder having holes, seldom more than an inch asunder, to receive them. As the press always stands near the wall, only one side of the cheese can be skewered at the same time, and it must therefore be turned half-way round, whenever that is necessary; but this occasions no inconvenience, as the skewers must be frequently shifted, and many more holes are made than skewers to fill them. In half an hour from the time the cheese is first put into press, it is taken out again, and turned, in the vat, into another clean cloth, after which it is returned to the vat; but is by some persons previously put naked into warm whey, where it stands an hour or more for the purpose of hardening its coat. At six o'clock in the evening the cheese is again turned in the vat into another clean cloth, and some dairy-women prick its upper surface all over an inch or two deep with a view of preventing blisters.* At six o'clock in the following morning it is again turned in the vat, with a clean cloth as before, and the skewers are laid aside: it is also turned two or three times more, both morning and evening, at the last of which finer cloths are used than those at first, in order that as little impression as possible may be made on its coat.

After the cheese has remained about forty-eight hours under the press, it is taken out, a fine cloth being used merely as a lining to the vat, without covering the upper part of the cheese, which is then placed nearly mid-deep in a salting-tub, its upper surface being covered all over with salt. It stands there generally about three days; is turned daily, and at each turning well salted, the cloth being changed twice in the time. It is then taken out of the vat, in lieu of which a wooden girth, or hoop, is made use of, equal in breadth to the thickness nearly of the cheese, and in this it is placed on the salting bench, where it stands about eight days, being well salted over, and turned each day. The cheese is then washed in lukewarm water, and after being wiped, is placed on the drying bench, where it remains about seven days: it is then again washed and dried as before, and after it has stood about two hours, it is smeared all over with about two ounces of sweet whey but-

* This, however, if they occur, can be remedied by opening them with a penknife, and pouring hot water into the incision; then press down the outer rind, put on a little salt, and place a piece of slate with a half-pound weight upon it.

ter, and then placed in the warmest part of the cheese-room.*

While it remains there it is during the first seven days, rubbed every day all over, and generally smeared with sweet butter; after which it should for some time be turned daily, and rubbed three times a week in summer, and twice in winter. The labor is performed almost universally by women, and that in large dairies where the cheeses are sometimes, upon an average, upwards of 1-10lbs. each.

The details of this process, it will, however, be observed, apply only to cheeses of 60 lbs. weight, and the quantity of salt used to them is uncertain; the greatest of which Mr. Holland knows is about 3 lbs. each, but much of it is wasted, and whether the cheese acquires much saltness in the salting-house, dairy men themselves are doubtful, though much salt is there expended. Respecting the heating of the milk, the practice must evidently vary according to the weather; and although it is his opinion, as well as that of Marshall and other well-known writers, that it most requires warming when produced upon poor, clay lands, and that upon rich soils it will not bear much heating, yet that is contradicted by Aiton, who says, "he never understood that the milk of the cows so fed or even upon will, waste land, or moss, requires to be heated more than that of cows fed in the warmest valleys, or on the richest haughts in our best cultivated districts." The sponginess and heaving of the cheese, which are sometimes complained of, are faults which Mr. Holland attributes more to inattention on the part of the workpeople than to want of skill, "their certain preventives being careful breaking, good thrusting, frequent skewering, and powerful pressing;" but may not improbably arise, partly from the use of cold and warm milk, which, if mixed together, will generate air. Those of pungency and rankness, which are generally imputed to impurity in the rennet, and by some to the want of salt, he, however, thinks may be also more properly ascribed to the fermentation occasioned by the imperfect discharge of the whey.—*British Husbandry.*

* On the cheese coming into the salting-house, it is, in some dairies, taken out of the vat, and after its sides are well rubbed with salt, is returned into the vat with a clean, fresh cloth under it: the top being covered with salt, it is placed on the salting benches, turned and salted twice a-day, and the cloth changed every second day. On the salting benches it is continued seven or eight days, when it is taken out of the vat, and with a wooden hoop, or cheese-fillet, round it, is put into the salting tub and managed as before described.

IMPROVEMENT OF POOR SANDY LAND.—The poor sandy heaths which have been converted into productive farms, evince the indefatigable industry and perseverance of the Flemings. It is highly interesting to follow step by step, the progress of improvement. Here you see a cottage and a rude cow shed erected on a spot of the most unpromising aspect, where the loose white sand blown into irregular mounds is only kept together by the roots of the heath. Trenching and levelling the surface is always the first operation. A small spot only is first cultivated, but gradually the whole is reclaimed from its wild state, by the aid of unremitting industry, and above all by the dung and compost heap and by the urine of animals. If there is manure at hand the only thing that can be sown on poor sand at first is broom, this grows in the most barren soils, and in three years it is fit to cut, and produces some return in faggots for the bakers and brickmakers; the leaves which have fallen have somewhat enriched the soil, and the fibres of the roots have given a certain degree of compactness. It may now be ploughed, and sown with buck wheat, and even with rye without manure; by the time this is reaped some manure will have been collected, and a regular course of cropping may begin; as soon as clover and potatoes enable the farmer to keep cows, and make manure, the improvement goes on rapidly—in a few years the soil undergoes a complete change; it becomes mellow and retentive of moisture, and enriched by the vegetable matter afforded by the decomposition of the roots of clover or other plants. If about twenty small cartloads of dung can be brought on each acre of the newly trenched ground, the progress is much more rapid, potatoes are then the first crop and generally give a good return. The same quantity of dung is required for the next crop, which is rye, in which clover is sown in the succeeding spring, and a small portion is sown with carrots, of which they have a white sort, which is very productive and large in good ground, and which even in the poor soil, gives a tolerable supply of food to the cows in winter. Should the clover fail, which sometimes happens, the ground is ploughed in spring and sown with oats and clover again. But if the clover comes up well amongst the rye stubble of it is cut twice after having been dressed with Dutch ashes early in spring. It is mostly consumed in the green state, the clover lay is manured with ten cartloads of dung to the acre, and rye sown again but not clover. After the rye comes buckwheat without any manure, then potatoes again manured as at first, and the same rotation of crops follows. It is found that the poor land gradually improves at each rotation from the quantity of dung used; for want of sufficient manure broom seed is sometimes sown with the rye and clover. The rye is

reaped and the broom continues in the ground two years longer. It is then cut for fuel. The green tops are sometimes used for litter for the cows and thus converted into manure. It is also occasionally ploughed in, when young and green to enrich the land. Oats, clover and broom are occasionally sown together. The oats are reaped the first year, the clover and young broom tops the next, and the broom cut in the third. This is a curious practice and its advantages appear rather problematical. All these various methods to bring poor lands into cultivation, show that no device is omitted which ingenuity can suggest to supply the want of manure. After the land has been gradually brought into a good state, and is cultivated in a regular manner, there appears much less difference between the soils which have been originally good and those which have been made so by labour and industry; at least the crops in both appear more nearly alike at harvest than is the case in soils of different qualities, in other countries. This is a great proof of the excellence of the Flemish system. For it shows that the land is in a constant state of improvement, and that the deficiency of the soil is compensated by greater attention to tillage and manuring, especially the latter. The maxim of the Flemish farmer is that, without manures there is no corn, without cattle there is no manure, and without green crops and roots cattle cannot be kept. Every farmer calculates how much manure is required for his land every year. If it cannot be purchased it must be made on the farm, a portion of land must be devoted to feed stock, which will make sufficient for the remainder, for he thinks it better to keep half the farm only in productive crops well manured, then double the amount of acres sown on badly prepared land, hence, also, the acres next reckon what the value would be of the food given to the cattle, if sold in the market, but how much labour it costs him to raise it, and what will be the increase of the crop from the manure collected. The land is never allowed to be idle so long as the season will permit any thing to grow. If it is not stirred by the plough and harrow to clear it of weeds, some useful crop or other is growing in it. Hence the practice of sowing different seeds amongst the growing crops, such as clover and carrots amongst corn or flax, and those which grow rapidly between the reaping of one crop and the sowing of another such as sparry or turnips, immediately after the rye is cut, to be taken or eaten off before the wheat sowing. These crops seem sometimes to be scarcely worth the labour of ploughing and sowing; but the ploughing is useful to the next crop, so that the seed and sowing are the only expenses, and while a crop that is of some use is growing weeds are kept down and prevented taking in the soil.—*Rev. W. S. Rham's Flemish Husbandry.*

CULTIVATION OF THE STRAWBERRY.

Permit me to offer a few practical remarks on the cultivation of the strawberry, a fruit not much inferior in some respects to the vine, and one in more general cultivation.

The mode we adopt in light sandy soil is as follows :—After preparing ground in the usual way, we mark off the rows at 26 inches apart; after stretching the line, we tread with one foot on each side to compress the soil; being now ready to receive the plants (we generally plant about the middle of March), we select the strongest plants of any variety, and commencing at one end we plant on the part which was trod upon—5 plants, in a circumference of about 18 inches, and 12 inches apart. After the ground has been planted on the above system, we procure some barrowfuls of sheep droppings, for it is on the application of such to strawberries on light dry soil, that the value of our remarks (if any there be) is to be considered. And with a small spade we put in a quantity on the space of ground within the circle of the plants, and after the plants have commenced growing, we give now and then, perhaps once a-week, a watering with water, in which about a bushel of the droppings to 4 gallons of water is used. By this means strawberries can be produced as good as where the soil is more adapted for bringing them to a high state of cultivation, as light dry soils in general do not produce such large nor well flavoured fruit.

Again upon stiff clay soils, we have acted differently, and found the plan we now recommend to suit better than the old system. In digging the ground intended to be cropped, we raise the ground where the plants are to run to the height of 6 inches, and about 8 in breadth, the distance between the rows will be about 22 inches, 4 on each side of the plant, and 14 the space to dig. It may be asked what advantage is to be gained by placing the plants on this raised ground over the old system of having them on level ground: the advantages to be derived are two-fold, at least in a cold wet climate, such as Locharber; first the roots being nearer and more exposed to the action of the solar rays, the blossom is produced much earlier, and, consequently, the fruit; and the over abundance of moisture is allowed to escape by the fall towards the middle of the row. However much they delight in a moist atmosphere, during their growing season, they are improved by being preserved, as much as possible, from the rain lodging between the rows. When the fruit is fit for gathering in stiff retentive soils, this plan will be found most desirable, and in digging and manuring them, instead of injuring the roots by the spade, we lay on the manure, and afterwards fork it in with a three pronged fork, and the crops in general are much improved over the old system. By attending to this, much success will be the result, I have no doubt.

The plants are planted in the usual way on the ridges, and in making the ground up, lay a good course of rotten cow dung for the roots of the plants to feed upon.

ASPARAGUS.

Asparagus beds which have been well manured and deeply trenched during winter will be in a fine state to receive the roots, which should never be more than one year from the seed. The proper time for planting is when the buds have begun to spring; indeed many excellent cultivators do not plant until the shoots have attained the length of four or five inches. Planting at that stage requires great caution that the shoots be not broken; it, however, prevents the chance of planting roots with defective or blind buds, which is of frequent occurrence. If the crop is intended to be permanent, plant in single rows four feet apart, and twelve inches plant from plant, in the line; but if it is intended to take up the roots for forcing, rows of plants may be set in four-foot beds with three feet alleys between them. In cold damp soils, and probably in all soils in cold situations, the soil in the alleys should be thrown on top of the beds, leaving the former a foot deep, thus placing the roots in a dry position, and also that they may more fully expand to the influence of the sun and air. When planted sow the ground with salt, and this stimulant should be applied frequently during the growing season. In dry weather Asparagus will be much benefited by liberal supplies of liquid manure, both at planting and afterwards.

Various methods have been tried whereby cuttings of tender plants may be safely conveyed to a distance, all of which are in some respect or other defective. A most ingenious and effective method was shown to us the other day by Mr Daniel, gardener to the Baron Hugal of Vienna, who is at present travelling in this country collecting animals and plants for the young Emperor of Austria. We may also remark that Mr Daniel is a native of Holland, a most enthusiastic gardener and botanist, has made several tours to this country, as well as having visited most of the best collections in Europe.

He carries with him several cylinder-shaped glass bottles, with wide mouths and glass stoppers similar to those used in chemists' shops for holding medicine; into these he throws his cuttings, just as they are taken from the plant, without any particular arrangement or order; a very little water is placed in the bottle, and when filled with cuttings, the stopper is hermetically sealed up. In this way he has been collecting for several weeks, and those he had from both Mr M'Nab and our-

selves, although they will not reach Vienna for probably a month or six weeks, he is satisfied they will arrive in safety and grow. He stated to us, that cuttings kept in similar bottles for fifteen weeks had grown most freely, and that many instances had occurred where they had sent out roots during their journey, and were immediately potted on their arrival at Vienna. So simple and efficacious a mode of sending cuttings deserves to be brought before the notice of cultivators, the rationale of which will be readily comprehended by such as have studied the principle of the Wardian case. To prevent damage during transit, these glasses may be packed within small wooden cases, for short journeys, but as light may have something to do in the matter, when sent to a great distance, arrangements might be easily made by which they could be placed within its influence.

Specimen heaths of the rarer and more difficult sorts to grow are wrought by Mr Daniel upon the stronger growing kinds, such as *melanthera*, *arborea*, &c.; on these the *tricolors*, *Massoni*, *elegans*, &c., are grafted, and some attain a very large size; nor does it appear from Mr Daniel's experience that they are afterwards short-lived. He was most struck with many of the plants in the Edinburgh Botanical Garden, and pronounced several of them as unrivalled in Europe. Nor was he less gratified in having an opportunity of seeing Mr M'Nab's most judicious method of shifting large plants, it so happening that the splendid plant, *Cocos nucifera*, was undergoing that operation during the time he was in the garden.

REMEDY FOR PREVENTING TURNIPS TASTING MILK AND BUTTER.—It is simply to cut a good slice off the top of the turnip, and another off the bottom, taking care to have all the roots off with the last slice; give the remainder or centre of the turnip to your cows, sliced as usual. If this simple method be *strictly followed* I will guarantee milk and butter sweet, and in quantities according to the allowance of turnips the cows get. I must add, I got this recipe from a friend, but never could get butter without a taint until I had turned off three or four men who attended my cattle, as they considered the topping and bottoming turnips was very troublesome, and always went back to the old method. I have now only to say, that I am feeding fifteen milch cows since the 20th of October, and have allowed them seven stone of turnips a day, and the butter last week produced best price in the most unfair butter market in Ireland. I give the tops and bottoms of the turnips so cut off to dry cattle.—*E. W. C., Dumkeeran, Dec. 6th, 1849.*

EFFECTS OF CULTURE.—The almond, with its tough coriaceous husk, has been changed by long culture into the peach, with its beautiful soft and delicious pulp, the acid sloe into the luxurious plum, and the harsh bitter crab, into the golden pippin; attention to nutrition has produced quite as marked changes in the pear, cherry, and other fruit trees: many of which have not only been altered in their qualities and appearance, but even in their habits. Celery, so agreeable to most palates, is a modification of the opium graveolens, the taste of which is so acrid and bitter that it cannot be eaten. Our cauliflowers and cabbages which weigh many pounds, are largely developed coleworts, that grow wild on the sea shore, and do not weigh more than half an ounce each. The rose has been produced by cultivation from the common wild briar; many plants may be modified with advantage, by supplying the growth of one part, which causes increased development of other parts.—*Dr. Trueman on Food.*

FATTENING OF HORNED CATTLE.—In countries where grain is cultivated in large quantities, there exists a deep rooted opinion that the fattening of horned cattle is positively disadvantageous except in large brandy distilleries; this opinion is, however, often unfounded. Local circumstances may alter the relative value of fattening, according to the results afforded by maintaining cattle for other purposes.

In calculations which profess to show that this branch of economy is unprofitable, the question is not correctly stated, the food given to cattle being estimated at the market price instead of at the cost of production; every one knows that the maintenance of cattle is indispensable to grain cultivation. The influence of this maintenance on the produce of the grain has indeed been developed in several parts of this work. Moreover, in the greater number of cases, we cannot dispense with horned cattle. The real question at issue therefore, is which kind of cattle are to be preferred, and with regard to horned cattle in particular, whether the quantity of fodder and pasturage devoted to them can be more advantageously consumed by milch cows or fatted oxen.

This question merges into the following:—

1st. What is the proportion between the quantity of fodder consumed by a milch cow during the whole year, and that which an ox consumes in the time required for fattening him?

2nd. What is the profit of an ox during the time that he is fattening, and that of a milch cow during the whole year?

We have already spoken of the quantity of fodder consumed by a milch cow, and the differences observed with regard to this matter. That required for an ox put up to fatten likewise

varies according to the size of the animal and the quantity of flesh and fat which we wish to give him. But it is perhaps easier to fix a tariff for each particular case of fattening than for those which relate to the management of milch cows. In localities where fattening is practiced to a considerable extent, the daily allowance which ought to be given to an ox of a certain breed is determined with tolerable accuracy. Hence in these countries it is usual to fix the weekly price which a butcher or cattle dealer is to pay for the feeding of an ox. This price, however, is subject to certain modifications, according to circumstances of place and time. This it is easy to calculate beforehand, and resolve the question for one's self. The result shows that fodder is often better repaid by fattening oxen than by milch cows, especially when the short time of fattening is compared with the maintenance of a cow for the whole year, and the care of the dairy; to this we must add that the fattening of oxen during the winter takes place at a season when labor is abundant, while the maintenance of cows continues during summer, when laborers are often difficult to obtain. In many cases also it must not be forgotten, the capital devoted to fatten oxen returns in four or five months, while that expended on milch cows is always floating.

On the average we may reckon that an ox while fattening consumes almost as much fodder as will suffice for a cow during the whole year, but at the same time the dung yielded by an ox while fattening, is equal to that which a cow furnishes in an entire year, and perhaps of better quality; besides, this dung is obtained at a time when it can be easily carted.

Even if it be thought advantageous to make fattening the basis of the economy of live stock, it may nevertheless be very useful as an accessory branch. When the whole economy of fattening is once thoroughly understood and organized, it will always be easier to regulate the number of animals put up to fatten according to the annual quantity of fodder, than that of any other description of cattle. We must be careful not to increase the number of animals maintained beyond what we are certain of being able to support even in bad years; the excess of fodder obtained in good years may be employed in fattening oxen which are always easily procured from without, even if we have none of our own that we wish to improve. It is commonly more profitable to sell fat than lean cattle.

Whoever would undertake the fattening of a large number of cattle must endeavour to acquire experience in the knowledge and valuation of them, and of all that relates to this branch of commerce, or at least must avail himself of the direction of a well informed and intelligent man. The choice and valuation of cattle require a certain practice of the eye, and still more a certain

tact of hand, which cannot well be acquired without long practice. It would therefore be useless to describe them here; they can only be obtained by actual inspection and comparison of a large number of cattle. Great facility in valuing cattle, and certainty in buying and selling, as well as in the whole process of fattening, are obtained by the use of a machine for weighing living animals; such an instrument is neither expensive nor complicated. A box formed of boards joined together, and of sufficient length and breadth to allow an ox to stand upright in it, is suspended by a chain from the shorter arm of a balance beam. There is a door for the animal to enter, and on the other side a rack into which a little hay is put to induce him to go in. The box rests firmly on the ground, the other arm of the balance beam, which may be of wood is ten times longer, a dish is suspended from it for holding weights. The equilibrium should be established by means of this dish in such a manner that the addition of the smallest weight shall raise the box when empty. The longer arm of the beam being ten times as long as the shorter, any weight placed in the dish produces a tenfold effect upon that which is in the box, the tenth part of a pound in the former will support a pound in the latter, and one pound will support ten. The weight of the beast is ascertained as soon as the box begins to move in the slightest possible degree; it must not be lifted for fear of frightening the animal. Such an instrument may be placed in a stall, the pivots on which the beam turns being suspended between two beams; it may also be put up in a yard, but it will then require a stand to support it. A machine of this description is also very useful for weighing fodder.

Some persons profess to determine the weight of a beast by the dimensions of particular parts, and the use of certain arithmetical formula. But even supposing this method to be applicable with tolerable certainty to the greater number of cases, the rules in question can be adapted to a particular race only, and one that is well fixed, so that every breed must require a distinct formula practically determined. That such is really the case has long been known in England. In the actual state of things it would be very hazardous to rely on such data.

According to the experience of English graziers, the weight of an animal in butcher's meat may be estimated with tolerable accuracy by its weight while alive.

By weight in butcher's meat we mean that which a beast weighs when hung up with his head, forelegs, entrails, and suet removed, the weight in net flesh as it is called. But for this purpose the health and condition of the animals must be taken into consideration. For an ox not absolutely lean, but still not fattened, Professor Anderson gives the following rule: 'Take half

the weight of the animal while alive, add to it four sevenths of the whole, and divide the sum by two, the quotient will be the weight of net flesh. For example suppose a live ox to weigh 700 lbs.

Half of 700...350 lbs.

Four sevenths of 700...400 lbs.

—
750 lbs.

Half sum.....375 lbs.

In this case 25 lbs would yield 105 lbs. But when oxen are a little fattened it has been found that 20 lbs. commonly yield 11 lbs., and when they are completely fattened 12 or 12½ lbs. For as an ox gets fatter the proportion of his flesh to the refuse becomes greater.

Finally in fattening cattle the greatest regularity must be observed in distributing the food, cleanliness, &c.

Matters of which I shall speak under the head of each description of fattening. In this place I content myself with recommending that no one undertake the fattening of a large number of cattle unless he can have an eye to them himself, or at the least, unless he can obtain the services of a man deserving of the most implicit confidence and thoroughly devoted to this branch of economy.—*Thaer's Principles of Agriculture.*

THE PREVENTION OF SMUT IN BARLEY BY STEEPING.—I saw in the Gazette of the 15th ult. a report from J. L. Hughes, in which he mentions about the barley in this district being seriously injured by the smut, and, taking a great interest in the prosperity of Ireland, I beg leave to mention an experiment that I tried this year with success. I have sown Italian barley for some years, on account of the additional straw, and it not being so subject to lodge as the other varieties; but having observed that the smut was increasing every succeeding year, I resolved to try an experiment on it, by pickling with two pounds of blue stone per quarter of seed barley, in the same way as I do with my wheat. But instead of sowing when newly pickled I kept it in the steep for forty-eight hours, and then sowed four bushels per Scotch acre, instead of three that I usually sow, and I found that the braid was no thicker than when sown only with three bushels. I sowed, on the same field, and on the same day, some barley in the usual way, which came up twelve hours before the pickled, although sown dry. I have the crop now cut, and on the portion of the field that was sown in the usual way, there is an increase of smut on last year, but where it was pickled there is scarcely a head of smut to be seen. If this system to prevent smut in barley has not been tried, and if you think it deserves a corner in your valuable paper, you may insert it.—Yours, &c.,
A SCOTCH FARMER.

Agricultural Journal

AND

TRANSACTIONS

OF THE

LOWER CANADA AGRICULTURAL SOCIETY.

MONTREAL, MAY, 1850.

We feel it our duty constantly to advocate the necessity for providing an agricultural education for the children of the rural population. It may not be possible, at once to introduce a perfect and general system of agricultural education, as we have not school-masters instructed to teach such a system; but by the establishment of one or more Agricultural Colleges, Model Farms, or Normal Schools, we should soon have a sufficient number of qualified school-masters to give an agricultural education at all the country schools. We do not propose that the sons of farmers should be confined to the study of agriculture alone. On the contrary, they should have education, where circumstances would permit, equal to any other class of the community; but, in addition to the education bestowed upon other classes, they should also be instructed fully in the science and art of agriculture. While preparing the machinery of this general system of education, there is nothing to prevent the immediate introduction into every country school, of suitable agricultural books and periodicals, for the reading and study of farmers' children. This is an advantage the children should have, whose fathers contribute towards the support of the schools. It is time that the rural population should have suitable, and the most useful instruction provided for their children, and not be obliged to be content with an education quite unsuitable for them, as under the present system. It is a generally admitted principle, that impressions made upon the youthful mind are the most lasting. "Just as the twig is bent the tree is inclined," is an

old adage, and, we believe, a very true one. At the common country schools, what are the impressions likely to be made upon the minds of farmers' children, by the general course of teaching adopted, and the books provided for their reading and study? Has any part of their reading or teaching the slightest tendency to recommend agriculture to them, or instruct them in the science or practice of it? No!—the "twig is bent" in quite another direction. The mind is occupied with anything or everything rather than agriculture, or the business of their parents, and that in which themselves are to be employed for their future lives. Under different circumstances, if the children of both sexes were occupied during a portion of their time at school, in reading suitable agricultural books, that treated of the principles of agriculture, the proper cultivation of the soil and garden, the management of crops, of horses, cattle, sheep, swine, poultry, the dairy, and general industry of the farm, and the house, when they returned from school in the evenings to their families, they would very probably be anxious to repeat what they had read at school, and learn to practice also, what they had been reading. This course of reading and study at schools, would unquestionably give an importance to agriculture in the estimation of the young, that it never has had, and never will have while the present system of education is persisted in. We do not offer these suggestions with a view of attracting the youth of other classes to agriculture, but rather that the children of farmers should have every opportunity afforded them, while at school, of obtaining with all other desirable knowledge, instruction in the science and art of agriculture, that might assist them to practice it hereafter with credit and advantage to themselves, and for the general benefit of their country. We cannot see any reasonable objections that can be urged against the course of study, reading, and where possible, the teaching we propose. The young, on leaving school, where probably they have never

heard or read of agriculture, or devoted one hour to its study, very naturally conclude, that it must be a business of no importance, and an occupation only suitable for the most ignorant of mankind, and that if it were otherwise, youth would be regularly educated for it, as for every other business and profession. These impressions give them a distaste and disinclination to agriculture, and if they are forced to the business, they are not likely to become good or successful farmers. This, we conceive to be a correct statement of the case. Parties may imagine it time enough after leaving school, for young farmers to study agriculture. To this we reply—there may not be inclination, time, or opportunity for this, when they return to their father's home; and why should the time be wasted at school in the least useful studies, while the most useful are wholly neglected? These matters may not appear of sufficient consequence to occupy attention, because they concern chiefly the unassuming rural population, but the period is not very distant when they will be *forced* upon public attention. Agriculture **MUST** be the main stay of Canadian prosperity, and no other speculations that ever can be planned or executed, can secure prosperity to this country. This is a plain, simple **FACT**—that all the philosophy and political economy in the world cannot disprove, as regards Canada. From our peculiar position and circumstances, whatever degree of prosperity the country may attain to, it must, in the first instance, be derived from the production of her own soil. It is from this source the means of life and action must be obtained for every other business, trade, and profession, that the various classes of the Canadian population may be engaged in. It is this conviction, formed, we are persuaded, upon sufficient grounds, that has prompted us for a quarter of a century to persevere in advocating the cause of agriculture, and the necessity of affording encouragement and instruction for its improvement. We may have failed in convincing others of the vast

importance of agriculture to the Canadian people, but, nevertheless, the fact is not the less certain, although a thousand to one were of a contrary opinion. If, then, our proposition be correct, and the prosperity of the country be desirable, how necessary must it be to give every possible aid and encouragement to the improvement of agriculture? We do not pretend to say that the whole population should confine themselves to husbandry. By no means; we only wish that agriculture should obtain the attention proportioned to its vast importance to every inhabitant of this Province. We are perfectly sensible that commerce, trade, and manufactures, are necessary to a prosperous condition of the people of Canada, but the success of commerce, trade, and manufactures, depend upon a prosperous condition of our agriculture. Commerce will have no employment, and trade or manufactures will have no customers, unless agriculture prospers, and produces abundantly. All may proceed harmoniously, if we begin at the beginning and obtain our first resources from the soil a bountiful Creator has provided for us, to be cultivated by our skill and industry. This is a certain source that never fails, and never has failed from the first creation of mankind, and it is from this circumstance that agriculture must be placed at the head, and before all other occupations and professions, and must be the source of wealth and prosperity, not only to this country, but to all others. When agricultural education becomes general, and fashionable, this matter will be better understood and appreciated. It is time, certainly, in the middle of the nineteenth century, that a suitable education should be provided for those to be employed in the most important and useful occupation of mankind. A country must create the means of her own expenditure, by raising what she wants, or the means to purchase what she may require. Canada cannot be a manufacturing country, further than to supply some of the wants of her own population. It is, therefore, upon

the products of her soil she must chiefly rely, now, and always. Any other means she may obtain, she must purchase by an equivalent, and where is this equivalent to come from, unless from the soil? It will be useful for us to understand our true position, that we may work out our prosperity where alone it can be found. Improve the agriculture of Canada, augment its productions, as much as possible, in quality and value, encourage the most simple and useful manufactories of our own raw productions for the supply of our own wants—let us export all the products that we can to advantage, and if all these do not secure the prosperity of Canada, nothing else will. The improvement of our water communications, and the extension of our Rail-roads, will, of course, proceed with agricultural improvement,—the one will give healthful action to the other. There must be better times in store for Canada. Such a noble country, possessing the best of soil, a favourable climate, the most extensive means of water communication, perhaps, in the world, and a thousand other advantages, cannot but become great and flourishing, when her people apply themselves in good earnest to make it so, and adopt the proper means. Let us not flatter and deceive ourselves by other speculations. The only hope of the country, we again repeat, is in the prosperity of her agriculture, so as to afford the means of healthful action to her trade, manufactures, and commerce, and all classes dependent upon them. We may be thought tiresome on this subject, but we feel it to be our duty constantly to advocate what we humbly conceive necessary to advance the improvement of agriculture, as it is with that object this Journal is published, and we propose to persevere until it is proved that we are in error in our views. There is another matter we most continue to refer to, as a means of accomplishing the improvements that instruction in the art of agriculture would show farmers to be necessary—that is—"Associations of

Agricultural Credit." Such establishments for the accommodation and assistance of well instructed farmers, would soon make Canada a very different country from what it is now; and certainly improve the condition of every class in it, except perhaps, the few who may now have money to lend, or to sell at a high price. The measures we respectfully suggest, cannot fail to benefit a vast majority of the people of Canada, and would not be unjust towards any portion of them. It remains to be seen what action will be taken on these subjects, or whether they will receive any attention. There may be some other means proposed by parties who may understand the subject better than we do, but if it should be so, we shall be perfectly satisfied to see the good produced to our country, by any lawful means, whoever may propose them. All we desire is—that what is necessary to promote the improvement and prosperity of Canada may be effected by some parties; and we hope that what is necessary will not be put off to a "more convenient season," that may never arrive. "Hope deferred maketh the heart sick."

AGRICULTURAL REPORT FOR APRIL.

At the commencement of the month, a considerable quantity of snow remained on the ground on the north side of the St. Lawrence, and for some miles on the south side also. The weather continued very cold, with severe frost up to the 19th, and rendered it impossible to execute any work in the fields, except to cart out manure, as top-dressing, or for other purposes. The ground was again completely covered with snow on the 14th. There was no chance to sow wheat previous to the 20th, in the neighbourhood of Montreal, or north of the St. Lawrence. Consequently, we fear it will be rather a dangerous experiment to sow much of the old Canadian varieties of four months wheat, as it would be liable to be injured both by rust and fly. It is certainly better for the crops to be a few days

later in sowing, and not be checked in their growth afterwards, than be sown early and have hard frost after the seed had vegetated and appeared over ground. We remarked, when the snow was first disappearing off grass or meadow land in April, the grass was very green and healthy, but we are not quite certain that this promising appearance was not considerably changed for the worse by the severe frosts when the land was exposed, and not very dry. The grass plants, however, are very hardy, and may recover this check. The deep covering of snow upon them up to the 1st of April, cannot fail to be very beneficial to grass lands. The winter altogether has been a very favourable one, and by no means severe. The only objection to our winters, is, when they are protracted, and continue far into the month of April. When this is the case, the working time in spring is greatly shortened, and farmers are frequently unable to finish their sowing in time or execute the work properly. They may not be able to procure hands or horses to execute the work properly in a late season, that they might get very well through, with less help, in an early season. Labourers, at a call when required, and money to pay them, are essentially necessary to good farming in our climate, and, frequently, short working seasons. When both are not forthcoming, farmers have not a fair chance of success. Every work has to be done in due season, and if not, serious loss is sure to be incurred. There is no work of the farmer, so far as regards the crops, from the time of sowing the seed until the crops are harvested, that can be put off without loss; and it is this circumstance that makes it so necessary that the farmer should have the command of labour in his own family, or be able to procure it when required, and pay for it. We continually see in Canada a considerable extent of land sown with seed, in a slovenly manner, manifestly requiring more labour of men and horses. The consequence is, that weeds prevail, and are not

taken out of the crops, and hence the produce is diminished materially. Slovenly cultivation of large tracts, and a waste of much seed, is a very general fault in the agriculture of North America. A better system, and applying more labour and skill, would yield more produce from half the quantity of land. We have been assured by a Canadian farmer who has adopted an improved system of husbandry, that the year before last, he had raised from 11 minots of seed sown a greater quantity and weight of grain than a neighbour of his had raised from 70 minots sown. This shows the advantage of a good system. It is very necessary, under the present circumstances of the country, that farmers should give their attention to raise products that will find a market. Perhaps horses and neat-cattle would pay as well as any products that could be raised for sale. Horses of the pure Canadian breed, and of good size, will, we have no doubt, always meet a ready sale for the United States, and at remunerating prices. We hope that all we have said in reference to Canadian horses will not be disregarded, and that farmers will in future be particular to raise a pure breed. To do this requires great attention. Mares should not be allowed to breed before they are four years old, and come to full size, and no entire horse should be permitted to go at large, after he is one year old. If stud horses are found to sell to Americans better than geldings, farmers should of course keep them in that state, but not allow them to go at large. We never can have a good breed of either horses or neat-cattle, while male animals of every age and description are allowed to go at large with the females of every age and description. This general plan has greatly deteriorated the horses and neat-cattle of Canada, and no wonder. If they were to act thus in the British Isles, their cattle would be much inferior to what they are at present. The keeping of stock in a proper manner, is also necessary to their perfection and profit. The

native breeds of horses and cattle, if managed judiciously, selecting the best animals for breeding, providing good and sufficient food for them, and crossing the cattle with a different breed of males of suitable size, we should have a very good and profitable stock for the country. We are not in a position here, in our present state of agriculture, to introduce a new and large breed of horses and neat-cattle. When the system of agriculture is in such an advanced state as that of the British Isles, we may wish to have large stock as they have in these countries. For our own part, under any circumstances, we would prefer moderate sized animals to the larger sized, for this country, and we have no doubt that they will always prove the most profitable stock, yielding more for what they consume than any other. Attention to the dairy is next in importance to the rearing of stock. This is a branch of farming very much neglected in Canada, and has not produced hitherto, in value, half what it might do annually, under better management. The butter of very many dairies, is of very inferior quality. We have frequently seen it selling in the Montreal Market, both fresh and salt, of very bad quality—the salt butter of various colours, and the several layers of butter separated in the cask and not closely or properly packed. Butter made up in such a manner is only fit to sell as grease for factories. On the other hand, we have seen most excellent butter, fresh and salt, selling at the same market, and this difference results generally from better management. Farmers who make bad butter, sustain a heavy loss, as they might have good from the same cows and milk. We have been told by a Montreal grocer, this winter, that he had purchased seven or eight casks of salt butter from a farmer in February, and that he had sold it again by the cask to housekeepers at 10d. per lb., and could sell a much larger quantity of the same quality of butter at the same price. This grocer had also most excellent cheese of Canadian make. If then some

farmers can make good butter and cheese in Canada, why should not all others be able to have both good? Suitable dairies are very necessary, but if farmers would take a little trouble they might have dairies that would answer. The milk and cream should certainly be kept cooler than the temperature of the air in our summers, and any dairy that will not keep it so, is unfit for producing good butter. Butter and cheese of good quality, would generally find a market here at remunerating prices. Farmers do not make the most of their advantages or they would be better off. Butter and cheese, to make them profitable, must be of good quality, and they will then find a ready market. The butter must be put up properly, and be of uniform quality, colour, and saltiness. Attention to all these matters is indispensable. In Cheshire, England, five cows are expected to yield in the season, a ton of new milk cheese, besides affording milk to feed their own calves. The calves are kept to four or five weeks old, and then sold to the butchers. If we could do this here, it would pay well. Of course, cows should be of a good description, and properly kept, both in summer and winter. In England, although so famous for root crops in many places, they prefer feeding their cows with bruised or ground oats to turnips, and consider it as cheap as turnips, and much better for the milk. In Canada, we consider oats more suitable than roots in the extreme cold of winter, though, perhaps, not so cheap. Ground oats or barley, at the low prices they have brought this year, would be much cheaper for cattle than waste grains of brewers or distillers. It is an extraordinary fact, that in the City of London, brewers' grains sell for about half, or two thirds the price charged for them in Montreal. In London, they do not charge quite a penny for waste grains per bushel, for every shilling per bushel they pay for the barley. Here the difference is more than double that proportion. Wheat should be the staple crop cultivated here, and perhaps the price

may seldom be so low that a good crop will not pay, at all events, better than any other grain. By careful experiments, new seed, and good cultivation, good crops might be raised, and if 20 bushels to the acre was raised and sold at 4s. the bushel, it would be equal to 16 bushels at 5s., and this proportion of price may apply to greater and less returns from crops. In any case, judicious cultivation, we have no doubt, will pay better than bad and slovenly cultivation, whatever may be the price per bushel of the produce. We do not know to what extent wheat may have been sown in April this year, but farmers should be prepared to sow what is to sow about the 20th of May, and should not allow the sowing to extend many days beyond that time. This period is very late, if we could safely sow previously, because unless the season is very favourable, the young plants are very liable to be checked by drought and heat that frequently occur about that time, and the sowing of grass seeds with the wheat is rendered very uncertain from these causes. In no case should the wheat be sown without being well washed in a strong pickle of salt and water, skimming off all the light and inferior grains. Barley should be sown as soon as possible, washing the seed in pickle, and skimming off all light grains. Steeping the seed in liquid manure, or the dung-heap drainings, for a day or two, is recommended, drying it with lime, ashes, or gypsum for sowing, as with wheat. This preparation is said to prevent smut in barley, and it greatly hastens its growth. As we observed in a former number, barley is the best crop to seed down land with. Oats should be sown the moment the soil is fit to harrow. When sown after grass ploughed in the fall or this spring, it would greatly improve the crop to run the plough in the furrows with a single horse, twice or three times, and shovel the loose earth off the furrows on the ridges. An active man might shovel the furrows of an acre in a day, and this expenditure would be amply repaid

by increased straw and grain. We have, in another place, treated of flax, hemp, carrots, parsnips, mangel-wurtzel, and Jerusalem artichokes, and need not introduce their mode of cultivation in this Report. Rye is often sown in the old country to cut as green food for stock. It should be sown much thicker than if intended to stand for a grain crop. Indian corn also answers well to cut for soiling cattle, and yields a large quantity of green food sown broad-cast, or a continuous row in drills. Buck-wheat is sometimes sown in England for soiling green, and is cut for this purpose immediately before, and when coming into blossom. Cattle and pigs are said to be very fond of it. It is also preserved for winter food for cattle, and answers well. For this purpose it is sown very thick, and is cut when in the blossom, and stacked, mixed with layers of dry straw. The straw imbibes the sap of the buck-wheat, and both keep well without being damaged—salt is scattered over each layer, but not in too large quantity. Cattle are said to eat this mixture with avidity, and to thrive upon it. Farmers cannot complain of want of good winter provender for cattle, when it can be so easily raised. Indian corn stalks might be kept well mixed with straw as in the case of buckwheat. Land, that is scarcely producing anything, might, if ploughed, yield a considerable quantity of provender for cattle; and after yielding this quantity of green food, might be summer fallowed, and greatly improved for a crop the following year. In the last number of the Journal, we submitted some remarks on the planting of potatoes, and do not think it necessary to add more at present, except to warn farmers not to apply fresh farm-yard manure to the seed when planting, and to complete the planting at once. Peas and beans should be sown as soon as possible—the beans in drills, formed as for potatoes. Planting potatoes and beans in alternate drills, we have already recommended as a good plan. We omitted to mention that salt is a very good dressing for wheat

or barley, particularly where the soil is very fertile. It prevents the crop from lodging, and is applied at the rate of from six to ten or twelve bushels to the acre. Independent of strengthening the straw, it is otherwise beneficial to the soil and crop. Indian corn succeeds best when planted from the 10th to the 21st of May. It is necessary that the soil should be dry and suitable. The corn that has been preserved upon the cobs to the period of planting, is the best for seed. It should be perfectly ripe, and not suffered to heat after the time of harvesting. Unripe or heated corn is unfit for seed. The market has been well supplied with butcher's meat, and some of most superior quality. We have seen beef and mutton that would be no discredit to any market in England. Indeed, the mutton, we considered much too fat—weighing, we suppose, 30 lbs. the quarter. In England, the fattening beef or mutton to an extraordinary degree of fatness, is being discontinued, as it was found to be unfit for the table, and what cost the farmer from six pence to a shilling per pound weight, was only fit to make soap or candles, and not worth half the cost of producing it. We hope we shall not get into similar error in Canada. It is, however, only a few farmers that are likely to do so. There is much more meat exposed for sale in the market, that is wanting in sufficient fatness than that which is over fat. All these matters will be better understood after some time. There can be no mistake, however, that the farmer who sells an animal to a butcher, not sufficiently fat, is at a loss, and is much more to be condemned than he who fattens his animals to a degree that rather exceeds what is necessary. If we could determine the happy medium, and act up to this, it would be a great advantage to all. On the 20th of April, we sowed some of the wheat formerly grown in Canada, on land in very good condition, the dust rising from the harrow. The same day, in the same field, we sowed some Black-Sea wheat. We intend to report

the result at harvest time. We would not think it safe to advise sowing the variety of wheat heretofore grown here, after the 1st of May, although we have known it to succeed when sown in the beginning of May, when the season turned out very favourably in August and September for ripening and harvesting; but this was previous to the appearance of the wheat fly. This destructive insect has done so much damage to the farmers of Canada, that every precaution is necessary to preserve the wheat crop from its ravages. We may make up our minds, that any wheat coming into ear from the 25th June to the 15th of July, will be in a greater or less degree damaged by the fly, but farmers may be guided by their own experience in the matter of sowing. Windy weather prevailing for a few days at the time of the wheat coming into ear, might tend to preserve the crop, but this seldom happens, as about that period, we generally have very calm evenings, and nights, that is so favourable for permitting the ravages of the fly. Sowing in drills about twelve inches apart, and hoeing and keeping down all weeds, grass, &c., not allowing any plant to live except the wheat, we conceive would greatly check the ravages of the fly; the grass and weeds about the roots of the wheat afford shelter to the insect during the day, and must doubtless encourage their presence. A free circulation of air to the crop, that would be given by sowing in drills, would cause the fly to seek better shelter, being a most delicate insect, and the hoeing would also disturb it in its place of repose, and very probably destroy it, or drive it from the field. It would be very desirable to sow some of our wheat in drill; it would always ensure a good cultivation of the soil to admit of this mode of sowing. We have seen in one of our late exchange English papers, a method of forming drills for grain that appears very simple. The following is the description of it:—"Ransom's, wheel ploughs are getting into much repute in Kent; and Mr.

Dickson, who has a good knowledge of mechanics, has made an improvement on them, by fixing a metal or iron wheel on the stilts, immediately behind the board, which revolves as the plough goes, and forms an indentation of from three to five inches deep, for the seed to fall into. This wheel is 120 lbs. weight. I held the plough having one of them attached to it, and found it very easy held; and the draft to the horses seems to be quite ordinary."

"Some of our mechanics might surely make such a wheel and attach it to a plough to act as the one in England is described to do. A wheat drill has been imported from the State of New York this spring by a Director of the L. C. A. Society, which we hope will answer, and bring drills into use. We hope if farmers have not been able to sow much in April, that they will have employed themselves at manure, by top-dressing and placing it in a convenient situation to be put into the soil as soon as possible. Farmers may rest assured that the sooner manure is put into the soil after it is made the more valuable it will be, no matter whether the seed is to be sown immediately after or not. Manure will produce more benefit rotting in the soil than in the farm-yard or dung-heap, though it should be put into the soil months before the seed is to be sown. We do not say that in every case this should be done, but we say that when the farmer has manure, if he has opportunity to plough it into the soil, he should do so at once, and leave it there, rather than in the yard or in a heap, to rot. Manure never gains by keeping, and from this fact it may be imagined what a loss of manure there must be, when it is kept over in the farm-yard for years, as it frequently is in Canada.

FLAX AND HEMP.

We have long recommended the cultivation of these plants in Canada, but we regret to say, that our recommendation has not been acted upon. We hope, however, that the time is now arrived that some action will be taken in the matter, and that these valuable plants will be

extensively cultivated, both for their seed and fibre, for home manufactures, and for exportation. We give in this number, some simple instructions for the preparation of the soil for growing flax and hemp, and the mode of sowing and management until harvested. We shall from time to time, refer to the subject again, and endeavour to show the necessity and profit of establishing machinery for the preparation of the fibre for future uses:—

FLAX.

The soil best suited for this plant is deep clay soil, sufficiently drained, and of moderate fertility. It is generally sown in Holland and other countries; after wheat or oats one ploughing is sometimes sufficient, but two are generally safest: one in autumn and again in spring. After the lea land oats, two ploughings are indispensable, and a third is frequently advisable, for the *land must be perfectly pulverized, and cleared of all roots of every sort*, or no crop; do not plough deeper than the vegetable mould, or so deep, if the soil is not good.

Sowing.—Sow early in May, so soon as the weather permits, the earliest sown is always the best crop; do not await perfect dryness in the soil. It is preferable somewhat moist, that the seed may vegetate quickly. Sow two bushels to the acre, of good and clean seed, when more is sown the crop is generally too thick; but thin sowing never gives fine flax. The ground being perfectly pulverized and cleaned, give a turn of the roller, and sow on the rolled ground, where clover and grass seeds are sown with flax (after wheat) the person who sows them follows him who sows the flax-seed, and both are covered with a double turn of the grass-seed harrow, which is light but broad, the teeth thickly set and short. Rolling the crop after sowing is injurious.

Weeding.—If weeds come, they must be drawn; but if the plough, the hoe and the hand have been sufficiently applied to the green crop (potatoo or other root), if flax is sown after either, and the roots of weeds and grass have been all gathered previous to sowing the flax, the weeding will seldom be necessary; however, whether sown after roots or grain, if there are weeds they should come away.

Ripening.—The test recommended to ascertain the degree of ripeness that gives the best produce with the finest fibre, perfect. It is this: try the flax every day, when approaching ripeness, by cutting the *ripest* capsule on an average stalk, across (horizontally), and, when the seeds have changed from the white, milky substance, which they first show, to a greenish colour, pretty firm, then is the time to pull. The old prejudice, in favor of much ripening, is most injurious, even as regards quantity, and the usual test of the stalk stripping at the root and turning yellow, should not be depended on. Where there is one man who pulls too green, five hundred allow to be over-ripe.

Pulling.—Use the Dutch method, say, catching the flax close below the bolls, this allows the shortest of the flax to escape, with next handful the puller draws the short flax, and so keeps the short and the long each by itself, to be steeped in separate ponds. It is most essential to keep the flax even at the root end, and this cannot be done without *time* and *care*, but it *can* be done, and should always be done. The sheaves should be small, evenly sized, straight and even, and should be put up in stocks or wind-rows, to dry before it is put into stacks.

HEMP.

Next in importance to the cultivation of flax would be that of Hemp, which is very largely imported into England. Nine-tenths of the whole quantity comes from the Russians alone. Large tracts of marshes and lands situated near rivers, occasionally flooded, would, undoubtedly, produce rich crops of hemp, if properly cultivated for it. We hope that some measures will be adopted to encourage the extensive growth of this highly productive and valuable plant in this country, that is well suited for it. Hemp, or *Canabis Sativa*, is an annual plant, usually rising to the height of five or six feet, in some situations, it is, however, capable of attaining to a much larger growth, and does so naturally in Canada. The flower and fruit grow upon separate plants. Those bearing the flower are called the male hemp; those bearing the fruit or seed, the female, the fruit grows in great abundance on the stem of the female hemp. This seed is not preceded by any corolla: a membranous hairy calyx,

terminating in long points, encloses the pestil, the base of which becomes the seed.

The male is quicker in its growth than the female hemp, and generally rises half a foot or more higher, by which provision of nature the farina from the stamina, or the fecundating dust, which conveys fertility to the seed, is readily shed on the lower plant.

Most soils may be made fit by good manuring for the cultivation of hemp, but rich moist earth is considered the most favourable to its growth. It seldom thrives on a stiff clay soil; a poor land will yield but a scanty crop, the quality, however, will be proportionately finer: while a strong rich land produces a great quantity, but this will be coarse, cultivators are therefore regulated in their choice of soil by the description of hemp which they wish to raise.

In England, where strong and heavy hemp is grown, the hemp gardens are small, and near the houses of the growers. These gardens absorb vast quantities of manure, and produce hemp every year without any alternation of the crop, or any change, except that, in years when the hemp is pulled early, a few turnips are sown for a stubble crop; when hemp is required for cordage it should be sown in drills, as a stronger and coarser fibre will be produced. When it is wanted for the purpose of weaving, then broad cast is the best method, as the stems rise more slender and fine, in proportion to their proximity, provided they are not so near to each other as to choke and impede the growth; there should never be a smaller interval than a foot between each plant. Three bushels of seeds is the ordinary allowance for an acre, when sown broad cast; this quantity being more or less according to circumstances. If sown in drills, a bushel and a half is found sufficient. After the seed has been sown, great vigilance is required to keep off the birds. After this period, the hemp ground requires very little care or labour, till it is fit for pulling. This plant is never overrun with weeds, but, on the contrary, has the remarkable property of destroying their vegetation.

Agriculturists sometimes take advantage of this well known fact, and by sowing a crop or two of hemp on the roughest soils, they subdue all noxious weeds, and entirely cleanse the ground from these troublesome intruders. The male

hemp comes to maturity three weeks or a month earlier than the female. It is known to be ripe by the flowers fading, the farina falling, and the stems turning partially yellow. This period is usually about twelve or thirteen weeks after sowing. It is the frequent practice to pull these before they are quite ripe, for after having arrived at their full maturity, the fibres adhere so tenaciously to the seeds as not to be separated readily without injury. In some cases cultivators gather both male and female plants at the same time, reserving a small part for seed. In Lincolnshire and on the Continent of Europe, they gather the male plant a month earlier than the female, and therefore small paths are made at intervals through the field, in order that the persons employed may pluck the plants which are ripe without trampling down those which are to remain.

The ripeness of the female hemp is known by the same indications as that of the male, and also by the calyx partially opening, and its seed beginning to change colour. They are both less injured by pulling too soon than too late; but when very young, though the fibres are more flexible and fine, the ropes which are made with them are found not to be so lasting as when the plants are gathered in a more matured state. Hemp is never suffered to remain ungathered till the seed is perfectly ripe, as at this period the bark becomes woody, and so coarse that no subsequent process can reduce its fibres to a proper degree of fineness. Some plants should, therefore, be preserved for seed. These require no particular cultivation, but the male hemp is likewise left rather longer than usual, that it may attain to maturity, and shed its farina upon the seed bearing plant. Forty plants raised is the common way, yielded only one pound and a half of seed, whereas from a single plant, which grew by itself, seven pounds and a half were obtained.

When the hemp is pulled, it is taken up by the roots, and before the plants are taken from the field, the leaves and flowers, and sometimes the roots, are taken off with a wooden sword; these are left on the ground, as they greatly contribute to enrich for the succeeding crop; the stalks are then arranged, as nearly as possible, in equal lengths, the root ends being all laid on

the same side of each handful or bundle, which is then tied round with one of the stalks.

When the hemp is gathered from the seed which is to be preserved, it is exposed eight or ten days to the air, after which the heads are cut off, and the seed thrashed and separated in the same manner as linseed. The processes to which the hemp is subjected, before it is rendered marketable and in a state fit for spinning, are very similar to those practised with flax. The same end is required to be attained, that of separating and cleansing the fibres from the woody and gummy matters which adhere to them, and the means used are therefore the same, the time and degree of each operation being proportionate to the different nature of the two fibres.

The heckles used for hemp are somewhat coarser than those for flax, the teeth of the coarsest are usually about an inch in circumference at bottom, diminishing gradually to a sharp point, and they are set about two inches apart from each other. The produce of an acre of land, sown with this plant, usually averages from four to five hundred weight of cleansed hemp, and from sixteen to twenty-four bushels of seed. The culture of hemp is considered to be very profitable, and therefore, as we have observed, when treating of flax, many attempts have been made to encourage its further growth, in England; but a great prejudice formerly existed against this crop, as it was supposed to exhaust the land.

Under an improved system of husbandry, however, particularly with reference to the seed, if made into compound, upon the same principle as linseed, to fatten cattle, its deteriorating effects would be entirely obviated. Hempseed affords a very useful oil, similar in its qualities to linseed, and also cake, which is largely imported, with the refuse of other oleaginous plants, roots and nuts, and sold to the farmers of England under the new fashioned name of feed-cake. In buying seed for sowing, the greatest care is necessary, lest it should have been kiln-dried, as it generally is previously to exporting it from Russia. We were disappointed in this way once—after going to considerable expense in preparing soil for hemp, there were not a dozen plants came up in an acre, the seed

having been worthless. After the first year farmers should be able to save their own seed, and be sure it is good.

PARSNIPS

Should be sown this month; to ensure a good crop, deep cultivation is necessary, and the earth finely broken, with the removal of all large stones. The manure should have been ploughed or dug, in the autumn so as to be incorporated with the soil. If that has not been done, the manure applied at the present season should be well decomposed and divided. They may be sown in beds, in rows across the beds 18 to 20 inches apart, or in raised drills, as for turnips formed by the plough, 28 inches apart, to permit horse hoeing, &c. In either beds or drills, the plants should be singled out to 8 inches apart. It is a good plan to germinate the seeds of parsnips and carrots, by mixing them with damp sand or earth, and placing them in a moderate hot-bed, or any dark warm place; they should be turned over daily, and sprinkled with water, and upon showing symptoms of vegetation they should be sown immediately. By germinating the seeds, they may be sown a fortnight, or three weeks later than by not doing so, and this gives additional time to prepare the land, and confers the benefit of knowing that the seed is good. The best varieties are the common long rooted, and hollow, crowned Jersey. Two pounds of sound seed are sufficient for an acre, and the seed should not have less than half an inch of close fine cover, and not more than one inch. The parsnip delights in deep loams, and deep well drained heavy soils.

CARROTS.

The preparation of the carrot is precisely similar to that described for parsnips, but the carrot may be sown a fortnight later than the parsnip, whether the seed be prepared or unprepared, and carrots delight in deep sandy soils. The most approved varieties for field culture are the long orange, altringham, purple, and white, and red Belgian, the white varieties grow the largest, but the red ones are the most nutritious. As spring food for horses, they are excellent, they fatten cattle amazingly, and they communicate no disagreeable flavour to the milk or but-

ter of cows, and pigs thrive rapidly on them. Carrots are as easy to raise as any root crop we grow, and if the land is suitable, and properly prepared for them, no crop will pay better. Of course, there would be no advantage in sowing too large a quantity, but every farmer should sow some in proportion to his means of storing them in winter. We always mix the seed largely with fine sand, and in sowing, if by hand, place two or three seeds at intervals of about 6 or 8 inches in the row? Thus much trouble is saved in the hoeing and weeding.

Preparing and manuring, and for Mangel-wurzel? The application of lime is considered necessary to produce a luxuriant crop of mangel-wurzel in the British isles, if lime is not naturally present in the soil; in every case a sufficient quantity of farm-yard manure is indispensable. The land should have been ploughed and drained in the fall. The deeper the soil the better. The moment the land is in order in spring, it should be well harrowed, having previously applied the lime, if this substance can be had. The land should then be ploughed, and allowed to remain in this state until the time of sowing, which may be early in May. Harrow the land well, and roll it, open the drills 28 inches apart, apply a sufficient quantity of manure, and immediately cover it with the plough. Flat the tops of the drills with a light roller, or by some other means, and sow the seed, (having previously steeped it in liquid manure for 48 hours) in a continuous row, or dibble them in, two or three seeds in a hole, at nine inches apart, when well up remove all but one plant. The after culture consists in keeping the plants thoroughly clean with the hand hoe, horse hoe, and grubber, or dig between the drills with a digging fork. When the plants begin to touch each other, remove every other plant, which may be consumed by pigs and milch cows; the plants will then stand eighteen inches apart, which in deep, well manured and well cultivated land, will be necessary to ensure a heavy crop.

JERUSALEM ARTICHOKE

Is a tuberous-rooted plant, with leafy stems, that grow from four to eight feet high. It thrives well on all rich soils, and it is said to succeed

on moist peat soils, but we have not tried it on the latter. We have not cultivated them to any great extent, but we have been told, that the tops are equal in value to oat straw, and will produce as much fodder per acre, and the roots or tubers are said to yield half the quantity of an ordinary crop of potatoes. The soil for this crop may be cultivated in all respects like the potatoe, and the after culture may also be the same. In good loose soil, the Artichoke will yield a considerable crop. After the most careful taking up the crop, as much seed remains in the soil, generally, as will be sufficient to produce the next crop. We would not, however, recommend that the land should be left to depend upon this mode of seeding. We should prefer preparing the soil annually, and supplying it with manure and fresh seed. The fibres of the stems may be separated by maceration, and manufactured into cordage or cloth; and this is said to be done in the north and west of France, where this plant is cultivated to a considerable extent as a field crop, and on poor sandy soils. There are very many rich and fertile portions of land, about farm houses, barns, and fences, producing only hurtful weeds, that if cultivated for the artichoke, would produce considerable food for men and animals—that would be much more profitable and creditable, than to have them occupied as at present, scattering seeds of weeds all over the country. The Jerusalem Artichoke is a very suitable plant for cultivating in waste corners, along fences, &c., and the product would be clear profit, and would not displace any other crop. By attention to these little matters, the condition of farmers would be much improved, as well as the appearance of the country. The stems of the artichoke have quite a luxuriant appearance, infinitely more pleasing to the eye than the common weeds of the country. We would observe, in conclusion, that we have not made use of the stems as fodder, but we do not see why they should not be good fodder, and that, as regards quantity, it is generally very large on land of ordinary fertility.

What shall we send to the Grand Exhibition of the Industry of all Nations, to be held in England in May, 1851? We shall not attempt

to reply to this question, excepting so far as regards agricultural products. To *compete successfully* with English products, with any we can raise, is scarcely to be expected. It is, however, in our power to send some of our products, to show what this part of the British Empire can produce, and we can send some that may be very creditable to the country, though perhaps, not equal to those of the first agricultural country on earth. As members of the great British family, it would, we conceive, be expedient to send specimens of every agricultural produce we raise in Canada, not as competitors, but to show what this country is capable of, as an agricultural one. There may be a few of these products that may be equal to any at the Exhibition. Our meadow grass, timothy, would, we are certain, be equal to any specimen of hay at the Exhibition, and this is a material item of the produce of land. Our peas are, also, of excellent quality; but for our other grain, we could not expect to have any equal in quality to those of England although we may show very good samples. Hemp, if cultivated here this year, would afford a sample equal to any grown in Europe, and this sample we should endeavour to send. Flax, cultivated in a proper manner, we should send a sample of, in seed and fibre. This country, we are satisfied, would produce very superior flax-seed, and it would be a most useful product for our own use, or for exportation. For any products we may send, it would be better we should make up our minds not to expect to compete successfully with those of the same species that are brought to greater perfection in England than in any country on earth. Indian corn might be produced here, by careful cultivation and a favourable season, equal perhaps, to any in North America. Our root crops, such as carrots, parsnips, and mangel-wurtzel, might make a very respectable appearance. We have fruits of various kinds that are excellent, so far as to show what our country and climate can produce. Next for our do-

mestic animals. Undoubtedly, we have some of every species very good, but what are the best of them to English stock in general? We send to England for neat-cattle, sheep and swine, to improve our stock. All we could show with them, would be to prove we did not allow the stock brought from our father-land to degenerate, no more than we did ourselves. The Canadian breed of neat cattle derive their origin from European breeds, but we should be glad to see specimens of the best of them sent to the Exhibition. The Canadian horse is also a European breed, and as this horse is, in our humble estimation, a very valuable one, we should rejoice to see an excellent specimen or two sent. In the last number of the Journal, we mentioned the Canadian hay-cart, as a superior implement of husbandry, worthy to be exhibited. There might be prejudice against them, as we have often witnessed with surprise in this country, when we have seen the cumbrous Scotch cart, and frame upon it, used for carting hay and grain, in preference to the hay-cart. Objection is made to the hay-cart, that the hay is not so readily discharged from the body of the cart, as it would be from one that was open; but by any man who takes the trouble to fill the cart properly it is discharged with perfect ease and facility. We have other implements of excellent make, but although they may be equal to those of England, we cannot flatter ourselves that they are superior. We omitted to mention maple sugar as a product that we should send, both clayed and refined. This is a product that we should be more interested about, and greatly augment the quantity raised. We have maple trees without number, and they are cut down and destroyed every day. We suppose, that sugar might be made from the maple tree as cheaply as from the sugar cane. We have the maple trees, and certainly we have a sufficient variety and quantity of other trees for use, that we might spare those that would produce sugar. This is a matter that should be

attended to. We might as well cut down fruit trees as the maple, and particularly when there is no necessity to do so. The maple trees should be preserved, and the making of sugar from them be made a regular business. We submit these suggestions for consideration. The Lower Canada Agricultural Society will have it in their power at their Cattle Show and Exhibition, which is proposed to take place at Quebec, next fall, to collect the best specimens agricultural products and domestic manufactures which they may think expedient to send to the great English Exhibition. This will be the fitting time and place for this Society to make the selection. We can have no pretensions to do more than show that we can raise agricultural products of very good quality, and can manufacture many articles of an excellent and suitable description, for our own use. How the selections that may be made, are to be forwarded to the great English Exhibition afterwards, is a question we shall not attempt to solve. Whatever may be done in this matter, the Lower Canada Agricultural Society will not be wanting, we are convinced, in doing all that can be expected from them.

The beneficial influence on this country of means of communication by water, rail-roads, and other roads, must be manifest to every one who considers the subject. It increases the value of what we have to sell, by diminishing the cost of transport to market, and it lessens the expense of what we have to buy, from the same cause. Hence it is the interest of Agriculture that our means of communication should be ample, extending to every section of this fine country. We have constantly advocated these improvements wherever necessary, particularly the great canals which connect the great Lakes of Upper Canada with the Ocean, and make them accessible to sea-going vessels, and the larger class of steamers. This grand undertaking was condemned by many parties as a most absurd and foolish expendi-

ture. The great work was, however, so manifestly necessary, that what surprised us was, that the British Government had not long before executed the work at the expense of the British nation, as a means of connecting this great country with the British Empire. We would have been unworthy of this noble country, and the vast inland seas of Upper Canada, if we had not made the great canals which connect these great waters with the Atlantic Ocean. The lakes were comparatively useless before these canals were constructed. Now we may indeed be proud of the works that connects them with the sea, and with all the world, we may say, as we have seen a ship pass down this canal from the upper lakes, that has gone round Cape Horn into the Pacific Ocean. We have made a great commencement in the Lachine, St. Lawrence, and Welland canals, that are unequalled in any country. If we go on with the improvement of our rivers to make them navigable, and with rail-roads where actually necessary, we shall greatly benefit the country. The great point is, that our expenditures for these purposes, shall be made where they are likely to be best employed, and make the greatest returns. This is necessary for a country that has not too much capital.

We have seen various samples of glass-ware from the manufactory of Messrs. Boden and LeBert, at Shneider's Landing, Vaudreuil, and feel great satisfaction in stating that the samples are very creditable to them, and we are confident that if this Native Glass Manufactory meets with the encouragement it is entitled to, the proprietors can, in time, supply every article of glass-ware required in Lower Canada. There is a fair commencement made, and we shall see what disposition there is to encourage a native manufacture. As to the excellent quality of the manufacture, there can be no question of it. Any orders can be executed according to the patterns given, or what may be required. Samples of the glass may be

seen at the People's Hotel, Notre Dame Street, Montreal, and the friends of native manufactures are invited to inspect them. Messrs. Boden and LeBert deserve great credit for their establishment. They have not confined it to the easy and simple manufacture of common window glass, and black bottles, but they have assumed the great expense and risk of manufacturing all descriptions of glass-ware, and if they are not encouraged and supported, it will be a certain proof of the want of patriotism in Canada, and a melancholy want of due encouragement for native industry.

Dr. Boutillier, M. P. P., of St. Hyacinthe, has sent to the Office of the Lower Canada Agricultural Society, a sample of dry peat, very similar, in consistency and appearance, to Irish peat or turf, and we have no doubt, would burn well in grates, and make a pleasant fire. We have not tried it in a stove, but suppose it would answer well. This peat is more like that of Ireland than any we have seen in this country. The Canadian peat or moss is generally very brittle, and when dug out crumbles down by exposure, into small particles; but this sent by Dr. Boutillier, is not so, but adheres very closely together, and in fact would make very good turf for fuel. At no distant period, it is very probable, that we shall be glad to have turf to make use of, and some of our moss could not be applied to a better purpose, as the land would be better after some of it was taken off, provided it could be drained, which in general is possible. Hand turf is made in Ireland, from the wastes of cut-away bog. This waste is something similar to our natural moss, as it will not adhere, until worked into a sort of pulp, by wetting it, and working it with the feet of horses or oxen. It is then formed by hand into shapes, larger than bricks, and set on the ground to dry. When partly dried, it is set on the ends, a few together, until it is perfectly dry and fit to be carried home, and secured for use. This sort of turf is of

excellent quality, for fuel, and very lasting. We believe our moss is quite capable of being converted into a good material for fuel, particularly in grates. There is no fire more pleasant than one made of good peat; it has no unpleasant smell, and is not so soiling as coal. Larger grates would be necessary than those made use for coal.

We have been told by a gentleman, a subscriber to this Journal, that several farmers objected to subscribe to it, on the grounds that we endeavour to make it appear, that there were not any good farmers in Canada. If any farmer, who may have seen the Journal, has given this interpretation to any remarks we may have submitted, we can assure them we never wished or intended to be so understood. Very much the contrary—we have constantly stated, that because we had many good farmers who raised good crops, and products of every description, other farmers might do likewise, by adopting the same good system of husbandry. We brought it forward as a proof, that it was not the soil or climate that prevent better farming generally, but because bad farmers did not follow the example of good ones. We have stated further, that the Journal was not written or published for good farmers, that were perfectly satisfied with their own system and the results obtained from it, but for the instruction and encouragement of farmers that were less fortunate, and did not understand or practice a good system of husbandry, or have good crops or cattle. The good farmers, however, might be so generous as to subscribe to the Journal, if only for the pride and satisfaction of knowing how superior their system of Agriculture was in its practice and results, to any proposed in this Journal. This gratification would be cheaply purchased at five shillings annually, although the Journal would be useless to them for any other purpose. The excuse given for not subscribing the small amount of five shillings annually towards the support of the only agricul-

tural periodical published in Lower Canada, is by no means satisfactory to us, as a just or well founded one, and we submit it to the friends and supporters of the Journal, if we have ever given any just cause for the objection. We have undoubtedly said that the very best system of agriculture, practiced in Canada, was far behind in its practice and results, the best system in the British Isles. Who that knows both countries will dispute this? A field may occasionally be seen here exceedingly well cultivated in every respect for this country, but where is our thorough-draining, and drilled grain crops, as in England, and 50 or 60 bushels of wheat to the acre produce from it? There are very few farms in Canada sufficiently drained, and that do not require many improvements to make them equal to an English farm. We do not say that it would be prudent to make so large an expenditure in this country where produce is so low, we only speak as to the fact—that we are far behind the best British farming. What are our pastures here compared to those of the British Isles? And with the exception of our cultivation for green crops, what cultivation do we give for wheat compared to what land receives in the old country for this grain. How few farmers in this country keep their cattle and sheep of different ages separated as in the old countries. This may appear of little consequence, but we know it has considerable influence on the thriving and profit of stock, although we have not been able to have them separated always. We do not say but many farmers may keep their stock properly separated, but we have not seen many do so. The strictest attention to all these matters is essentially necessary in a well conducted farming establishment, in the old countries, and without the same attention in this, we cannot pretend to carry on a perfect system of husbandry. The stock upon a farm should be of equal value to the tillage, and unless properly managed in every respect, they cannot be profitable; and this good management includes the

keeping separate the different ages and descriptions of farm stock.

THE PRESERVATION OF EGGS, CREAM, AND BUTTER, FOR LONG SEA VOYAGES.—The best possible method of keeping eggs fresh, sweet, and sound for use, is to anoint them just as they are laid, and yet warm, with sweet fresh butter or hog's lard. This stops the pores and completely excludes the oxygen of the atmosphere which the egg would otherwise imbibe. They may by this means be kept any length of time, but it will be necessary to wipe them clean occasionally, and anoint them afresh, lest the greasy matter should turn rancid. In packing, they should be placed on the small end, having the large uppermost. It must be observed that eggs so kept are not fit for hatching, the closing of the pores destroying the vitality of the cicatricula. In addition to which the late Mr. H. D. Richardson recommends, packing them in a mixture of salt dried in an oven, and charcoal; the latter, he says, preserves the vital principle, so that they may be hatched. We would recommend you to preserve the butter by melting it. Put it in a suitable vessel; place the butter in another, containing water: set the whole on a slow fire till the butter is thoroughly melted; keep it in this state for an hour, or till all the impure parts have fallen to the bottom, and has the appearance of pure transparent oil; pour it off into clean vessels, and when it cools it may be salted with half an ounce of pure-salt, one eighth salt petre, and a quarter of an ounce of sugar to 16 ounces of butter; it may also be preserved by mixing it in its fluid state with any quantity of pure honey from one to four ounces of the latter to every pound of butter. This mixture is said to keep for several years without becoming rancid, and is most suitable for warm climates; the jar should be tied down with bladder; milk may be preserved by evaporating it in a water bath to half its volume, frequently removing the albuminous matter or skin as it appears on its surface; it is then strained and set to cool, and when thoroughly so, put into bottles, and well corked again, placed in the water bath, (leaving the necks above water) for two hours. A small por-

tion of well beaten egg yolk should be added to the evaporated milk, which will prevent the cream from separating from the serous parts; thus treated, milk has kept sweet for two years. According to Mr. Appert; cream, when condensed or reduced in the water bath about one fifth, and afterwards strained, bottled and treated in the same manner, kept perfectly sweet for two years.

PROPORTION OF LINSEED MEAL TO FEED CALVES WITH.—You must accustom the calves to the use of linseed meal, gradually; begin with $\frac{1}{2}$ lb. daily, made into gruel and mixed with the milk each meal, and increase it for the first month up to $1\frac{1}{2}$ lbs.; the second $2\frac{1}{2}$ lbs.; the third $3\frac{1}{2}$ lbs.; and the fourth $4\frac{1}{2}$ lbs. The increase depends upon the quantity of milk available. Calves, after a month or six weeks, can be fed on linseed meal alone, without any milk. There is no decided rule, circumstances must decide, some calves requiring much more than others. We think you ought to rear a calf to every cow; a dairy is unprofitable if it does not turn out 100 lbs of butter at least, and a calf to every cow.

"KOHL RABI."—Kohl Rabi, when intended for transplanting, should be sown from the middle of April to the middle of May; if not to be transplanted, the sowing may be put off to the middle of May; drills should be formed, and the seed sown in the same way as is usual for turnips, or the drills formed and the plants planted out on the crowns of the drills, when of sufficient size, which should be by the middle or end of June. Let the rows be twenty eight inches apart, and the plants eighteen inches apart in the rows: they require as much manure as turnips; the purple variety is the largest; the roots may be grown, up to seven or eight pounds.

NOTICE.

THE ANNUAL GENERAL MEETING of the LOWER CANADA AGRICULTURAL SOCIETY will take place at their Rooms in this City, on FRIDAY, the 17th day of MAY instant, at ELEVEN o'clock, A. M.

By order,

WM. EVANS,
Secy. L. C. A. S.

Montreal, May 1st, 1850.

CANADIAN GLASS MANUFACTORY,
NEAR SNYDER'S LANDING, VAUDREUIL,
*Erected and carried on by Messrs. Boden
& Le Bert.*

THE Proprietors of this establishment are prepared to Manufacture **LOOKING GLASS PLATE and WINDOW GLASS**, of every size, coloured and fancy, according to patterns or orders. Shades for Oil and Gas Lamps, plain, tinted, or coloured, in the richest hues—Coloured Glass of any pattern for Churches, similar to those of European Churches; also, for Cottages, Gardens, Houses, and Steamers—Bottles and Vials for Druggists made to order.

—ALSO,—

SODA, GINGER, and ROOT BEER BOTTLES,
with or without the maker's name.

—AND,—

MILK CANS, of suitable sizes.

All these articles shall be of the very best quality and disposed of on reasonable terms; and the proprietors solicit a share of public patronage, and the examination of their Manufactures.

For orders or further particulars enquire of the proprietor, at the People's Hotel, No. 205 and 207, Notre Dame Street, Montreal.
Vaudreuil, January, 1850.

FARMING IMPLEMENTS.

WE, the undersigned, certify that we have carefully inspected a variety of Farming Implements manufactured by Mr. A. Fleck of St. Peter Street, and we feel great pleasure in recording our unqualified opinion that they are very much superior to any article of the kind which we have seen manufactured in the country, and equal to any imported.

And we would particularly recommend to the notice of Agriculturists throughout the Province his Subsoil Grubber, which he has improved upon from one which took a premium of £10 from the Highland Society of Scotland. This implement seems well adapted to improve and facilitate the labours of the Farmer, and we cannot doubt that it will soon be extensively used in improved cultivation. His Scotch and Drill Ploughs are also very superior, and well worthy of the inspection of every one desirous of possessing a valuable article.

M. J. HAYS, Cote St. Antoine,
President M. C. Agricultural Society.
P. P. LACHAPPELLE, Sault au Recollet.
W. M. EVANS, Sec. L. C. Ag. Society.
JAMES SOMERVILLE, Lachine.
EDWARD QUINN, Long Point.
T. E. CAMPBELL, Major, Civil Secretary.
HUGH BRODIE, Cote St. Pierre.
P. F. MASSON, Vaudreuil.
P. E. LECLERE, St. Hyacinthe.
JAMES DAVIDSON, Quebec.

REAPING MACHINES.

THE Subscriber has on hand three **REAPING MACHINES** of the latest and most improved construction, capable of cutting twenty-two acres per day. Being manufactured by himself, he is prepared to warrant both material and workmanship as of the best order. Price moderate.

MATHEW MOODY, *Manufacturer.*

NEW SEED STORE.

THE Subscriber begs to acquaint his Friends and Customers that he has, under the patronage of the Lower Canada Agricultural Society,
OPENED HIS SEED STORE.

At No. 25, Notre Dame Street, Opposite the City Hall, Where he will keep an extensive assortment of **AGRICULTURAL and GARDEN SEEDS and PLANTS** of the best quality, which he will dispose of on as favourable terms as any person in the Trade. From his obtaining a large portion of his Seeds from Lawson & Sons, of Edinburgh, who are Seedsmen to the Highland and Agricultural Society of Scotland, he expects to be able to give general satisfaction to his Patrons and Customers. He has also made arrangements for the exhibition of samples of **Grain, &c.**, for Members of the Society, on much the same principle as the Corn Exchanges in the British Isles. He has a large variety of Cabbage Plants, raised from French seed, which he will dispose of to Members of the Society, at one fourth less than to other customers.

GEORGE SHEPHERD.

Montreal, April, 1849.

NOTICE—Some excellent Barley and Oats for sale, for seed, the produce of seed imported expressly last Spring from Britain—Samples to be seen at Mr. Shepherd's Seed Store.
Montreal, January, 1850.

Agents for the Agricultural Journal.

H. Aylmer, Esq.,	Melbourne and Ship.
Capt. Stewart,	Clarenceville.
R. J. Robins, Esq.,	Pointe à Cavignol.
Rev. F. Pilote,	College of St. Anne.
Dr. Grosbois, M. D.,	Chambly.
Dr. J. H. R. Desjardins,	Green Island.
Dr. Conquy,	St. Cesaire.
Dr. De la Bruère,	St. Hyacinthe.
Mr. T. Dwyer,	St. Pauls, Abbotsford.
Paul Bertrand, Esq., N.P.,	St. Matthias.
Thos. Cary, Esq., (Mercury),	Quebec.
Dr. Smallwood,	St. Martin, Isle Jesus.
Robt. Ritchie, Esq.,	Bytown.
Major Barron,	Lachute.
L. Guillet, Esq.,	Three Rivers.
Hon. F. A. Malhiot,	Verchères.
J. B. E. Durocher, Esq.,	St. Charles, Chambly.
A. C. Cartier, N. P.,	St. Antoine.
John Mc'Arran, Esq.,	Murray Bay, Sag.

— All communications connected with this Journal to be addressed, post paid, to the Secretary of the Society—WILLIAM EVANS, Montreal.

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OF THE

Lower Canada Agricultural Society.

VOL. 3.

MONTREAL, JUNE, 1850.

NO. 6.

A meeting of the Directors of the Lower Canada Agricultural Society took place at their Rooms in this City, on Monday the 29th day of April, 1850, several members were present.

John Yule, Esq., the President of the Society, having taken the Chair, stated: that an application had been made to him on behalf of the Committee appointed to arrange the Industrial Fair to be held in this City this year, preparatory to the Grand Exhibition to take place in London, in, 1851, requesting to know what part the Lower Canada Agricultural Society would take in the matter; when the following Resolution was proposed, and adopted unanimously:—

Resolved,—That the Society, with a view of giving the assistance in their power, to the Committee appointed to arrange the Industrial Fair to be held in this City this year, preparatory to the Grand Exhibition in London, in 1851; hereby appoint J. Yule, Esq., President, Major Campbell, Evans and Langevin, as a Committee to act conjointly with them, and that the Directors regret the absence of means to contribute otherwise to the advancement of the objects in view.

The Secretary was instructed to address a letter to the Secretary of the Committee for arranging the Industrial Fair, apprising them of the foregoing Resolution. Other business of the Society was then discussed, and the following Resolutions unanimously adopted:—

1st. That the Lower Canada Agricultural Society petition the Provincial Legislature to amend the Act of Incorporation of this So-

ciety,—that in the 6th Section, the word “nine” shall be replaced by the word “five,” and that 9th Section, the word “fifty” shall be replaced by the word “fifteen.”

2d. That another Petition be presented to the Provincial Legislature, to ask for an investigation, in that manner which may appear best suited, to ascertain the present state of Agriculture generally, and the best means for advancing the improvement of that important interest.

3rd. That the Society see with regret, that the debts they have contracted for the publication of the Agricultural Journal in English and French, and the great difficulty of collecting the subscriptions, will prevent them from holding the Provincial Exhibition, which they at first proposed to hold this Fall, until the year 1851. That the Society, however, believe that they could not have applied the funds of the Society and the aid granted by the Legislature, to a better purpose, than in disseminating useful and practical instructions and suggestions by their Journals; and the Directors of the Society hope that the Legislature and the Agricultural public, will give their approbation to the plan they have been obliged to adopt.

4th. That a Petition be addressed to the Provincial Legislature, praying that a grant in aid, similar in amount to that made to this Society last Session, may be granted to them the present Session and annually.

5th. That the Report made by the Committee appointed to examine the accounts of Messrs. Lovell and Gibson, for printing the

Agricultural Journal, be received and approved. The Secretary submitted several letters and other documents connected with the business of the Society. The books containing the receipts and expenditure of the Society were also placed before the Directors.

The Secretary was instructed to prepare the Annual Report, to be submitted to the Annual General Meeting of the Society, which he was also directed to give notice for in the Agricultural Journals, to take place on Friday, the 17th day of May next. He was further instructed to prepare the Petitions to the Provincial Legislature resolved upon at this meeting. The Directors resolved that the Books and Periodicals in the Library of the Society, should be lent to Members, one at a time, and that a Book should be prepared and left upon the table of the Society's Rooms, where any Member taking a Book or Periodical, should enter the title of the same, with the date when taken, and also note the return of the same. The Directors expect that no Member shall keep a Book or Periodical more than two weeks at most. The Meeting then separated.

By order,

WM. EVANS,

Secretary, L. C. A. S.

Montreal, April 29, 1850.

The cows kept in Lombardy, where the famous Parmesan cheese is made, are generally of the Swiss breed, and very handsome. The bull chosen is generally of a rich, dark brown colour, small, straight backed, with slender limbs and a small head. Such is the description of a bull approved for breeding dairy stock, and is certainly not at all a buffalo shape, or anything approaching to it, or to that of many bulls we have seen that have been highly prized. Neither large or small sized cattle that are of coarse make or form, are fit for the dairy, or at least, are not the most profitable for it. The best dairy cows we have ever seen, were fine in the head, neck, and

limbs, heavy and broad in the hind quarters, and light in the fore, and these are sure marks of a good dairy cow.

The Annual General Meeting of the Lower Canada Agricultural Society, took place at their Rooms in Montreal, on Friday, May the 17th, pursuant to advertisement in the Agricultural Journals published in English and French.

The President, John Yule, Esq., having taken the Chair, read the proceedings of the last meeting of Directors. The Secretary presented the Annual Report, which being read, it was proposed and seconded, that the Report be received and approved, which was carried unanimously. The meeting then proceeded to elect a Board of Directors for the ensuing year, in conformity to the original Rules and Regulations of the Society, confirmed by the Act of Incorporation by the Legislature, and the following gentlemen were chosen, viz. :—Hon. A. N. Morin, Speaker of the Legislative Assembly, Hon. B. De Boucherville, M. L. C., Hon. Adam Ferrie, M. L. C., Hon. G. R. S. De Beaujeu, M. L. C., Major Campbell, John Yule, Esq., Rev. J. G. Desaulniers, Rev. F. Pilote, D. Finlayson, Esq., P. E. Leclerc, Esq., D. M. Armstrong, Esq., M. P. P., Dr. Bouillier, M. P. P., Jos. Cauchon, Esq., M. P. P., R. N. Watts, Esq., M. P. P., A. Jobins, Esq., M. P. P., L. Lacoste, Esq., M. P. P., Dr. Taché, M. P. P., A. Turgeon, A. Pinsonnault, J. N. Poulin, A. Morris, A. N. Archambault, F. Armand, Fils, J. E. D. Bellefleur, John Gilmour, F. A. La Rocque, H. L. Largevin, L. A. H. Latour, A. Vaudaudaigne, Dr. Valois, Joseph Vincent, J. Gibbault, and Wm. Evans, Esquires.

Major Campbell, seconded by the Hon. Adam Ferrie, proposed a vote of thanks to the late President of the Society, John Yule, Esq., for his very efficient services as President of the Society for the past year, and for his very proper conduct in the chair, this day, which was unanimously adopted. The meeting then dissolved itself.

THE ANNUAL REPORT OF THE LOWER CANADA
AGRICULTURAL SOCIETY.

The Society have now been in existence for a period of more than three years, and although they may not have effected all the good they were desirous to produce, it is satisfactory to know they have been instrumental in exciting a very considerable interest amongst the rural population, and others, for the improvement of Agriculture. If there was no other proof of this, the greatly increased demand this Spring for Agricultural seeds of every description, from all parts of Lower Canada, to the Seedsman of the Society, would clearly demonstrate that this interest has been created, and produced practical effects that will soon display themselves, and have a very beneficial influence upon the Agriculture of this section of the Province. The Society, instead of making a display by Cattle Shows and Exhibitions, have endeavoured to awaken a spirit of inquiry, and desire for improvement amongst Agriculturists in Lower Canada to its remotest bounds, and they have reason to suppose with considerable success. The primary object of the Society was to effect the improvement of Agriculture where it was most required; and this, they were convinced, could not be effectually accomplished in the commencement, by Cattle Shows and Exhibitions, the benefit of which are generally participated in *only* by our best farmers, men of capital, and perhaps having their farms in good order, while those who really required instruction and encouragement to improve their system of husbandry and stock of cattle, would feel themselves virtually excluded, at least, from any share in the premiums distributed. The efforts of the Society, therefore, have been directed to instruct and encourage those who would be so excluded in their present circumstances, and enable them to come forward as competitors at Cattle Shows and Exhibitions, on equal terms with those who are now in advance of them in Agricultural skill and other advantages, and who conse-

quently, would take all the premiums to themselves at these Exhibitions. Under these circumstances, the Society have the satisfaction to believe, that the funds that were at their disposal have been employed as judiciously and advantageously for the improvement of Agriculture, *where most requiring it*, as they could be in any other way for the attainment of that object. Their action has had a general effect, and was not confined to one locality, nor was the distribution of their funds made to parties who were good farmers, or men of capital, requiring no payment or encouragement for doing or having what they knew was for their own advantage. The Society have published an Agricultural Journal, containing information and instruction in the science and practice of improved husbandry, and have circulated this Journal to the extent of about 3,000 copies (2,000 in French, and 1,000 in English) throughout every parish of Lower Canada, where improved systems of husbandry were little known or practiced; and the Society confidently hope, that the "seed" they have thus sown, and are sowing, will succeed and flourish, and yield an abundant produce of good to the rural population and to the country generally.

The Chartered Societies of the British Isles publish each a quarterly Journal, which they denominate their "Transactions," containing the most useful information on Agricultural subjects; together with recording the "Transactions" of the Societies, which, however, only form a small portion, comparatively, of the Journals. These Transactions are published at a considerable expense to the Societies, and distributed to the members. The Report of one of these Societies last year, gave this cost of publishing as over £1500 annually, and there were only receipts for copies sold to the amount of about £150, but the Report stated that the publication was highly estimated, and a principal means of obtaining members for the Society, and connecting the Society together.

The Lower Canada Agricultural Society, while they exist, will find it necessary to publish a Journal, to make their existence and usefulness known throughout the country. A monthly publication is better suited to a scattered population over an immense extent of country, and to the circumstances of the farmers, than a quarterly or annual Journal would be. An annual Cattle Show and Agricultural Exhibition, would be very desirable, but would not supersede the necessity of publishing an Agricultural Journal of some description, under the sanction of the Society. The Society's usefulness will altogether depend upon the amount of improvement they are instrumental in producing in the Agriculture of Canada.

If only one Canadian farmer in a parish, adopts an improved system of husbandry, and obtains favourable results from it, there is no doubt, others will follow the example. This Society possess the advantage of having the confidence of those whom they are desirous to benefit, and, therefore, their recommendations or those sanctioned by them, have, they are glad to say, that degree of influence that confidence is always sure to confer—This confidence is more generally inspired from the Society having hether to applide all their disposable means, to instruct farmers and encourage them, to adopt a better system of husbandry where manifestly requiring it.

From a considerable portion of the Roman Catholic Clergy, the Society have received the most useful support, particularly from his Grace the Archbishop of Quebec, and his Lordship the Bishop of Montreal. Their influence in the country will have the very best effect in promoting the object the Society are so anxious to accomplish—the improvement of Agriculture.

In the month of December last, the Society passed a Resolution to hold a Cattle Show and Agricultural Exhibition at Quebec next September. First, from a desire to satisfy parties who wish to have such Exhibitions, and se-

condly, to show the people of Lower Canada that this Society do not confine their attention to one portion or section of the country, but extend it to all parts. They regret, however, that the want of adequate funds and the difficulty (of collecting) the subscriptions due to them will prevent them holding this Exhibition this year unless the Legislature grant the means. The Society are rejoiced to find a greatly increased number of visitors to their Rooms at Montreal, from the most remote sections of Lower Canada, most of them coming to make enquiry on Agricultural subjects, and to purchase seeds from the Society's Seedsman, who has already disposed of nearly all the foreign Agricultural seeds imported last fall and this Spring.

There is another evidence of the progress of Agricultural improvement, in the greatly increased demand for Agricultural implements of the most approved construction this Spring, and many of them purchased by Canadian farmers.

The Society continue to augment their Library, and have now some of the best works on Agriculture, both in English and French. They also receive several valuable periodicals from the British Isles, including the Transactions of the Highland and Royal Irish Agricultural Improvement Societies, the Transactions of the New York State Agricultural Society, and the Canadian Agriculturist from Upper Canada.

By order,

WM. EVANS,
Acting Secretary.

Montreal, May 17, 1850.

At a subsequent meeting of the Board of Directors, elected at the Annual General Meeting, which took place on the 17th of May, instant. The following gentlemen being present:—John Yule, Esq, Major Campbell, Hon. Adam Ferrie, F. A. LaRocque, P. E. Leclere, A. Turgeon, H. L. Langevin, L. A. H. Latour, and Wm. Evans, Esquires. Mr. Yule, the late President, was called to the

Chair, when the following Resolutions were unanimously passed:—

That Alfred Pinsonnault, Esq. be elected President of the Society for the ensuing year. That William Evans, Esq. be elected Secretary. That the Hon. G. R. S. DeBeaujeu, Hon. Adam Ferrie, Rev. F. Pilote, Rev. G. Desaulniers, R. N. Watts, Esq., M. P. P., and P. E. Leclerc, Esq. be elected Vice-Presidents. That John Yule, Esq., Major Campbell, and the Hon. A. N. Morin, compose the Executive Committee.—That Major Campbell, Alexander Morris, and H. L. Langevin, Esquires, compose the Finance Committee.—That F. A. LaRocque, L. A. H. Latour, and Alexander Morris, Esquires, compose the Journal Committee.

The Secretary submitted copies of Petitions prepared for the Provincial Legislature, ordered at a former meeting of the Directors on the 29th April last, which were approved of. Instructions were given to the Secretary to prepare a statement of the Funds of the Society, to be transmitted to the Provincial Legislature, with the Annual Report, approved of at the Annual General Meeting of the Society.

The meeting then separated.

By order,

WM. EVANS,

Secretary, I. C. A. S.

Montreal, May, 1850.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

The following very valuable lecture was recently delivered before the Royal Agricultural Society of England. It is a most interesting and valuable statement, and will, we trust, lead to some important practical results:—

LECTURE ON SOILS AND MANURES.

Mr. Way stated that he had on that occasion to bring before the Society some facts and observations in regard to the action of soils upon the constituents of manure. These observations he believed to be perfectly new to the Agricultural public, and he hoped to show that they would throw much light on some of the operations of practical Agriculture. As, however, he was preparing a paper for the next Journal of

the Society, in which he would go minutely into the subjects and give the results of the investigations which had been proceeding for the last eight or nine months in his laboratory, he should that day merely give an outline of those results, avoiding everything in the shape of detail. It had often been observed that the dark liquid from a manure-heap, if by chance placed upon a bed of soil through which it could filter, issued from the bottom almost or altogether deprived of colour. Again, the water of drainage, especially in heavy clay soils, was observed to be free from colour, and often beautifully clear and limpid. What was the nature of these actions? Were they the effect of mere mechanical filtration and the separation of the solid substances suspended in the water? Most persons would answer in the affirmative, and such had been the general impression hitherto, but it did not meet all the circumstances of the case.

On the table were glass filter-jars, containing a red soil from Mr. Pusey's estate in Berkshire. The soil, as the gentlemen present would see, occupied the jars to the depth of 5 or 6 inches. Upon one of these Mr. Way poured water obtained from one of the sewers of London. To another filtering-jar he added a quantity of the fetid liquid produced in the steeping of flax. Both of these liquids were turbid, highly coloured, and exceedingly offensive to the smell: but it would be seen that, so soon as having passed through the soil they began to drop from the jar, they were no longer the same. The resulting liquid had an earthy smell it was true—a smell always accompanying soils—but was no longer offensive to the nose. Now, to what ingredient of the soil was this metamorphosis due? Was it due to the sand acting as a filter? It was easily proved that such was not the cause; and that there might be no doubt on this subject, Mr. Way would pass through a filtering-jar, containing more than 9 inches depth of fine white sand, a quantity of cow's urine taken from a tank in the country. The liquid was so far altered by the filtration, that the turbidity was removed as it would be by filtration through paper; but the colour and disgusting smell remained in all their intensity. Sand, therefore, obviously was not the active ingredient in soils in respect to the power under discussion. The same must be said of the different forms of gravel, which were only coarse sand. The other great ingredient of soil was clay, and to this Mr. Way attributed the power in question. As an experiment comparative with the last, he would pass the same tank water through sand, mixed with one-fourth of its weight of white clay in powder, and they would observe the result was very striking. The liquid coming through was clear and free from smell; indeed, it was hardly to be distinguished by its external characteristics from ordinary water. There

could be no doubt, then, that the property of soils to remove colouring matters, and organic matters yielding smell from solution, was due to the clay contained in them. Filtration was only a method of exposing the liquid in the most perfect form to the action of the clay, but it was not necessary to the success of the process. In proof of which Mr. Way stirred up a quantity of soil with putrid human urine, the smell of which was entirely destroyed by the admixture, and upon the subsidence of the earth the liquid was left clear and colourless. It appeared, therefore, that the clay of soils had the property of separating certain animal and vegetable ingredients from solution; but was this property the only one exhibited? Mr. Way had found that soils had the power of stopping also the alkalies, ammonia, potash, soda, magnesia, &c. If a quantity of ammonia, highly pungent to the smell, was thrown upon a filter of clay or soil, made permeable by sand, the water first coming away was absolutely free from ammonia. Such was the case also with the caustic or carbonated alkalies, potash, or soda. This was a very wonderful property of soils, and appeared to him as an express provision of nature. A power, he remarked, is here found to reside in soils, by virtue of which, not only is rain unable to wash out of them those soluble ingredients forming a necessary condition of vegetation; but even those compounds, when introduced artificially by manure, are laid hold of and fixed in the soil, to the absolute preclusion of any loss either by rain or evaporation.

But Mr. Way had found that this property of clay did not apply only to the alkalies and their carbonates, but to all the salts of these bases, with whatever acid they were combined. Here again was a beautiful provision; sulphate of ammonia, when filtered through a soil, left its ammonia behind, but the sulphuric acid was found in the filtered liquid—not, however, in the free state, but combined with lime; thus sulphate of lime was produced, and brought away in the water. In the same way muriate of ammonia left its ammonia with the soil, its acid coming through in combination with lime, as muriate of that base. The same was true of all the salts of the different alkalies, so far as he had yet tried them. Thus lime in the economy of nature was destined to one other great office besides those which had already been found for it—it was the means by which the salts ministering to vegetation became localized and distributed through the soil, and retained there until they were required for vegetation. Mr. Way pointed out that, from what he had just shown, it must be obvious that there was no provision for the ordinary salts of lime themselves. It was necessary that when the alkali of a salt is laid hold of by a soil, some provision should exist for the neutralization of the acid with which it was

combined; for all other salts lime performed this useful office, but it had nothing to fall back upon for its own salts. Sulphate, muriate, or nitrate of lime, when passed through a soil, would come through unchanged. This, however, did not extend to lime itself, or to its carbonate, when dissolved in carbonic acid, as it is found in most waters. Quicklime, when dissolved in water, is removed by passing the water through clay, or through moist soils containing clay; and carbonate of lime in solution is so effectually removed, that hard water may be softened by the same process.

With regard to the extent to which these actions were capable of being carried, it was not to be supposed, that we could go on filtering indefinitely with the separation of the salts contained in the liquid; on the contrary, the limit was soon reached; but although small in percentage quantity, the power was, in reference to the bulk of the soil, enormously great. He had found that a pure clay would absorb, perhaps, two-tenths per cent. of its weight of ammonia—that is to say, 1000 grains would separate two grains of ammonia; and from reasons which need not then be noticed, a loam, or a well cultivated clay soil, would absorb nearly twice as much. Now every inch in depth of soil over an acre of ground weighed about 100 tons; consequently, 10 inches of depth of such soil would weigh 1000 tons, and would be adequate to combine with, and retain, 2 tons of ammonia, a quantity which would be furnished by about 12 tons of guano. Now, one-sixtieth of this power would suffice for the preservation of the ammonia of an outside dose of guano; consequently, he was justified in saying that the property was practically of immense activity. Mr. Way stated that he had ascertained the extent of the power in different soils, and for the different alkalies. The property was decidedly a chemical one; and although he intended only to state the facts, without entering upon their explanation, he might say that he had every reason to believe that he should be able to develop that satisfactorily at the proper time.

Having thus endeavoured to call their attention to this highly interesting subject, the lecturer went on to point out very shortly the different operations of practical Agriculture, upon which it was likely to throw light.

First, as to manuring: Obviously if there was a provision in the soil for the retention of the salts of manure, and for the ammonia and other products of the decomposition of animal and vegetable matter, the soil was the proper place for those decompositions to go on, and no matter how remote the period when the crop would be taken, it would be perfectly safe to get the manure into the land as soon as practicable after its production. Again, the equitable distribution was a point also which seemed of consider-

able importance; for, it was an absolute necessity that a new class of compounds was formed in the soil immediately the manure reached it, and it seemed to follow that those compounds furnished the elements of nutrition to plants; consequently we should seek to produce them by every means in our power. Liquid manuring, wherever practicable, was an effectual way of securing this distribution. In the case of artificial manures—that is to say, manures composed of chemical salts—much simplicity was introduced by the new discovery. Henceforth we must regard the different salts (those of ammonia, for instance) as of value in relation to the price of the ammonia, or other base contained in them, since they are all alike when incorporated with the soil.

In liquid manuring it had been usual to think that the application must be made to grass, or to land bearing some crop; but now it was known that the land, not the plant, retains the manure, no theoretical difficulty could arise in the use of liquid manure for arable land.

In irrigation the principle now illustrated must certainly be of great importance, if, as there is but little doubt the chemical characters of the water are of consequence, and that the soil is the means by which the salts and organic matters are separated for vegetation; then it will be obvious that the water should be made to flow *through* rather than *over* the soil. This reasoning is consistent with the observation, that to produce the full effect irrigated land should be well drained.

The application of water to land not at the time bearing a crop, would be clearly admissible under this view, and is indeed practised extensively in Germany and some parts of Italy. Mr. Way also pointed out that the proper depth for drainage must be materially influenced by this property of soils to absorb manure. Without asserting that this or that depth was the most advisable, he thought it would be admitted that the water of drainage should pass through a depth of soil regulated, amongst other circumstances, by its particular power of detaining the manures placed upon it.

To the question of the application of sewer refuse from towns these experiments brought much light, and they clearly proved that the sewer water might be applied in an unintermittent way, provided that a due relation were maintained between the capacities of retention of the soil, the quantity of manure applied, and the amount of crop taken in a given period. The great obstacle to the use of sewer manure, based upon the belief that it must be applied to the plant in actual growth, or it would otherwise escape in the drains, is thus removed. Lastly, after adverting to the probability that the power of soils to remove carbonate of lime, and thus soften water, might be turned to account for the

supply of towns with pure water; Mr. Way said that he had great hope that with the clue he now possessed, some material progress might be made in the elucidation of the action of lime itself upon soils, which he had reason to believe was closely connected with the phenomenon which he had that day had the pleasure of explaining.

On the motion of Mr. Fisher Hobbs, seconded by Mr. Paine, the best thanks of the meeting were voted to Professor Way, for his kindness in delivering another lecture before the members, and for the newly discovered and important agencies of the soil, in reference to manure, which he had so ably explained to them on that occasion.

THE MAKING OF COMPOSTS.

I have come to the method by which I increase my stock of manure—partly from experiments of my own, partly through the reading of Agricultural journals, and partly through the suggestions of some friends. At any rate I have found that method highly successful; and I am most willing to give a full account of the way I proceed, hoping that other farmers may benefit by it, as I have done.

First of all, I have tanks, tubs, &c., in which I collect all the urines, the liquid manure, and the rain-water—the more the better, as long practice has taught me that nothing is better; and to the farmer it is a real treasure, which increases in value the longer it is kept. This liquid manure is required for the making of solid manure. However, should it be difficult to collect liquid manure, a mixture may be made which might replace it. In that case, rain water should be collected in tanks, the surface of which should be large, whilst their depth is small, so that the sun and air may act the sooner upon it, and hasten its corruption. In this water I throw weeds, useless roots, green plants, rubbish of all kinds. I would especially recommend for that purpose euphorbia, tamarisks, and all lactiferous plants. In winter, when such plants cannot be procured, I replace them with the leaves of evergreens, such as pine, fir-tree, box, ivy, moss, etc. To the mixture thus prepared I add quick-lime and sal-ammoniac, in the proportion of 10 lb. of quick-lime and 5 ounces of sal-ammoniac, to about 200 gallons of liquid. Although I mention these proportions as those I have made use of, yet what I say must not be taken as an absolute or general rule: each man must act according to his own resources, and his own wants. What I wish to show is merely the principles for the application I have made of it may often; be far from being the best. I will further remark that the tanks should not be too deep—about four feet is quite enough; and the several reservoirs constructed should be placed a little elevated

above the adjoining one, so that the contents of the first may be easily emptied into the second, and so on.

We are now in possession of one of the necessary elements in the manufacturing of my manure; and I will suppose that we have either liquid manure or corrupted water, prepared as above stated, in sufficient quantity.

Suppose, then, that we wish to make about two tons of manure: for that purpose I begin by taking 200 gallons of liquid manure, or of corrupted water; and to this I add—

- 200 lb. of human excrement, or urine.
- 50 — chimney-soot.
- 400 — dry lime.
- 60 — limestone.
- 20 — wood-ashes.
- 2 — sea-salt.
- 1 — saltpetre. (In all, 783 lb.)

To this mixture add 50 lb. of the ferment kept from the preceding operation: but, in case this is the first time that you have thus prepared manure, you must increase by one-fourth the quantity of each of the solid substances mentioned above, making the entire mass 916 lb. If the soil be light and sandy, I have often found it expedient to add some clay, in order to give greater consistency to the liquid mixture, and more firmness to the manure.

I will tell you how to do, if you cannot procure some of the matters I have mentioned. Instead of 200 lb. of human excrements, you may put 40 lb. of fermented barley or buckwheat, or 100 lb. of sheep-droppings, or 200 lb. of pig or cow dung: 100 lb. of burnt soil will replace the 50 lb. of soot, and 2 lb. of potash will do instead of the 20 lb. of wood-ashes. It is better to put rather more than less of these different elements; and I need scarcely say that it is well to add to the mixture the poultry-yard manure, pigeons' dung, rape-seed cake, and such other beneficial substances as can be procured with ease, and without great expense.

The place in which to mix these ingredients must be chosen near the tanks, and it should be paved, in order to lose as little as possible of the liquid; and it is important that it should be on such a slope, as that the liquid running from the watered manure may fall into a cask or tub placed at the lowest part of the slope. Part of this liquid may be kept, to be used as a ferment in the ensuing year. I must not forget to mention that the liquid manure should be often thoroughly mixed by means of a curved spade. Monsi^r Jauffret, a French agriculturist of note, from whom I have borrowed part of this process, used to build up his manure on a wood grating, through which the liquid escapes more easily, and the action of the air is increased. The same result will be obtained by employing small bundles of branches and wood, upon which the manure may be constructed. To make the ma-

nure, all kinds of young shrubs, leaves, reeds, &c., can be used, together with straw. A bed of common grass will be often required to increase the fermentation. If you have sufficient time, I advise you to cut the straw; and as for the ligneous matters, such as whins, small roots, &c., their length must not exceed 8 or 9 inches.

Everything being ready, you may build your manure-heap about 21 feet long, 8 in breadth, and 7 in height. This is merely an average size; and it is quite evident that it will be of no consequence if the heap should be a little larger or smaller. Next put a bed of straw, reeds, &c.—over the branches, &c., which are laid upon the ground—about one foot thick; then water it thoroughly with the liquid: if possible, it is better to soak the dry elements of the compost in the tanks, and, as you take them out, build them upon the heap. Then lay a second bed, another foot thick, and water it as before, and so on, until the heap has attained a sufficient height, when you may have it well trampled down. Each bed having been separately trampled, then spread on the top the mud that is found at the bottom of the tank, after which you cover the whole with a bed of soil or chaff a few inches thick.

On the fifth day after these operations have been completed, the manure will be pretty well drained, and you may then turn it over, so that the top of the old heap be the bottom as the new. This being done, you have the heap watered as thoroughly as possible, and then immediately covered, as before, with a bed of soil or chaff.

On the seventh or eighth day the compost will begin to smoke, especially in the morning, and a strong smell of manure will be felt. You then bore holes in it with an iron auger an inch and a half in diameter, and about 5 feet and a half in length—the holes must be 3 feet deep, and 6 or 7 inches distant from each other—and you then water the heap with liquid manure through these holes, and immediately afterwards close them, merely by the pressing of the foot, when you lay a new bed of soil or chaff over the whole compost.

On the ninth or tenth day you bore new holes, deeper than the first, and, as much as possible, in different places; you then water the heap by these new holes, and have them closed in the same way, and lay a new bed on the top formerly. It is to be remarked, that all these new beds are themselves soon converted into manure by the watering, and the fermentation of the compost. If the compost is merely made of straw, you had better stop the fermentation at 134 degs., and that, by means of an abundant watering; but if there be any woody matter amongst it, let the fermentation go on to 1-3 degs. In this manner the compost is prepared, and ready to be used at the end of a fortnight in summer, and of three weeks in winter. Although, by

being often watered, the manure will keep for any length of time, it is better to make use of it as soon as it is ready.

I have sometimes made use of the liquid contained in tanks in another way, which I have found to be very beneficial. I had a heap of loose earth, which was watered from time to time, and thoroughly mixed by means of a mason's shovel, handled by one man, whilst another with a spade cut the edges, and threw them into the heap. When once the mixture was well prepared, I put it in a heap, and had this new kind of mortar spread in very small quantity over some natural meadows, in the month of November. Although it became very dry by being long kept, it was broken into small bits with the greatest ease, and thus spread upon the land.

Instead of waiting a long time for a compost, as I am obliged to do by the ordinary process of preparing it, I have made, in the space of twelve days, a very good compost in the following manner:—I spread a bed, one foot thick, of my manufactured manure, then a bed six inches of over-seven or eight feet in height. Immediately over it a bed of loose earth, over which a bed, one foot thick, of farm-yard dung, six inches of loose earth, and so on, until watered by means of holes bored in it in the way I have before described; and having repeated the waterings three or four times, I obtain a compost, of the very best description, in the course of about a fortnight.—*Quarterly Journal of Agriculture.*

JERSEY CATTLE.

Colonel Le Couteur, Aide-de-Camp to the Queen, and Viscount of the Island of Jersey, presented to the Council a lithographic impression, from two beautiful drawings, made by himself, of a bull and a cow of the Jersey breed, on which were marked the "scale of points," approved by the Royal Agricultural Society of Jersey at their general annual meeting in January last, as constituting perfection in their peculiar and well-known breed of dairy cattle, and as furnishing to their judges a simple and definite process for arriving at satisfactory conclusions in making their awards. Col. Le Couteur entered into a detailed and very interesting statement of the character of animals, in which any one or more points specified in this scale were more than usually developed. The drawings then laid before the Council were not portraits of any particular bull or cow of the Jersey breed, but represented an ideal assemblage of individual excellencies occurring in different animals, and selected from the finest cattle on the island, collected together at Col. Le Couteur's farm for the express purpose in view, and carefully submitted to the inspection and comparison of the gentlemen who formed the special committee

appointed by the Jersey Society to revise the "points" of their stock. Col. Le Couteur, in detailing the points thus agreed to by the committee, called the particular attention of the Council to some of those points found to be most intimately connected with the natural excellence of the animals, and the characteristic peculiarities of the Jersey breed, of which the island, in Col. Le Couteur's opinion, at that time contained some of as perfect specimens as could well be conceived. He remarked that the cows which had the inside of the ear tinged with a deep yellow colour were invariably found to yield butter of a rich orange colour, while those with ears of a lighter tint furnished butter of a correspondingly inferior quality, and of a paler hue. In the finest stock, too, the eye of the cow was soft and placid, while that of the bull was lively and full of fire. The "action" of Jersey cattle also indicated, not only their muscular power and their mode of employing it, but that general conformation and adaptation of parts which constituted excellence: a finely-bred Jersey animal, Col. Le Couteur remarked, ought to walk off the ground like a race-horse. By means of this determination of a standard scale of points, the labour and responsibility of the judges were much reduced, while their decisions almost invariably gave satisfaction; as, in the case of any difference of opinion, a third party being called in, the award was at once decided. During the 10 years that he had acted as Secretary to the Royal Jersey Agricultural Society, he had never known the occurrence of an absolute case of dissatisfaction. In reply to inquiries made by the Chairman and Colonel Chalonier, he proceeded to state, that no animal received approval excepting through the Society, the members being allowed a free exhibition, while strangers were required to pay an entrance fee; the number of points assigned by the judges being duly stamped on the horn of each animal. Colonel Le Couteur, in reply to further inquiries, admitted that this guarantee of merit might, by unprincipled dealers, be imitated for the purpose of deception. At the present time, many animals were easily passed off as of the true Jersey breed, especially those of black, or black and white colour, from Normandy, and others from Brittany, which were very inferior, as dairy stock, to the genuine animals of that breed.—The Chairman wished to know how the term "Alderney" had been generally applied in England to the Channel Islands' cattle, and whether the animals of that island possessed advantages over those of Jersey or Guernsey.—Colonel Le Couteur said that, on the contrary, there was at the present time scarcely an animal in Alderney that he would think worth purchasing. He explained that that island had belonged to his great grandfather, who introduced into it a great number of the Jer-

sey cattle, which, however, from the inferiority of the pasture, soon deteriorated from the original stock.—Colonel Le Couteur, Mr. Parkins, and Mr. French Burke, then cited particular instances of the great amount of butter yielded by dairy cows, during the flush of grass in May and June, or throughout the year, if fed in a particular way, and tended with great care, namely, 16lbs. a week in those months, or 1 lb. a day in other cases during the year. Colonel Challoner then stated the case of a finely-bred handsome Jersey bull of his own, which, though perfectly healthy and fat, had his skin constantly affected with a yellow powder or scurf of a deep orange colour, especially within his ears and on his tail, a result he could only attribute to an abuse made of him by parties to whom he had been good-naturedly lent.—Colonel Le Couteur then expressed the great pleasure it would at all times give to himself, as one of the Governors of the Royal Agricultural Society of England (or to his successor in the office of Secretary to the Royal Agricultural Society of Jersey), to receive applications from any of its members who required advice and aid in obtaining the best dairy animals which that island could produce. He had had last year the satisfaction of freighting a vessel with 33 head of such stock, to a gentleman residing in Scotland, which arrived in perfect safety, and maintained the high character of the Jersey breed.—The Chairman referred to a challenge given by Mr. Villebois, one of the Governors of the Society, to the county of Bucks, in which he resided, in favour of two of his dairy cows of the Channel Islands' breed, which had produced him both milk and butter of almost unexampled quantity and quality.—Mr. Alcock, M. P., remarked that it would be highly desirable, if in the case of other breeds of cattle, a similar scale of points could be established, in order that the doubt and difficulty of the judges, and the frequent dissatisfaction of competitors, might be removed by the adoption of such a defined standard of adjudication as would have the effect of limiting and defining the conditions of merit in the competing animals.—Colonel Le Couteur stated, that when some years ago he had shown to the late Earl Spencer the scale of points for the Jersey cattle, his lordship expressed to him the desire he felt that such a step should be taken in reference to other breeds.—Colonel Challoner said that he could fully corroborate that statement, for he had the pleasure of being present with Lord Spencer and Colonel Le Couteur at the time it was made.—Mr. Burke remarked that he was also fully aware of Lord Spencer's wishes on that point.—The Chairman felt how highly desirable the adoption of so definite a system would prove; but at the same time he feared that our judges would have great difficulty in defining the required points, and unanimously agreeing to them.—On the motion of Mr. Parkins, the

best thanks of the Council were expressed to Colonel Le Couteur for this kind offer on his part, and for the interesting documents and statements with which he had favoured them.

MANURE—ITS GENERAL AND PARTICULAR APPLICATION.

Lime ranks among the soluble manures, a fact which the preparation of lime-water fully establishes; but there are many other chemical salts that are completely soluble in water, and therefore, are qualified to act rapidly upon vegetable roots—such are the sulphates so opportunely noticed in Mr. Cuthbert W. Johnson's article in the last number. To these may be added the potent salt called soda ash, or British alkali, which, according to Dr. Fownes, "contains, when good, from 48 to 52 per cent. of pure soda, partly in the state of mild carbonate, partly as a caustic hydrate, the remainder being chiefly sulphate of soda and common salt." This chemical compound has, of late, been greatly extolled as destructive of the wire-worm; but of this I say nothing, as no positive proof of the fact has been communicated to me. The object which now should be urged, is the great necessity of further and more rigid analyses of the staple earths, and of the plants that grow upon them. Advances have been made, and numerous tables formed, by many able chemists; but the results prove so dissimilar that at present we are constrained to hesitate.

Guano, if pure and dry, not developing any odour of ammonia, ranks among the most excellent and comprehensive of partially soluble meliorators. Its soluble ingredients consist chiefly of sulphates, muriates, and phosphates of ammonia, soda, potassa, and magnesia, in varying proportions—uric acid and oxalic acid also in combination are often traceable. The insoluble bulk of the substance consists of bone-earth (sub-phosphate of lime), in a state of very minute division. This fertilizer will be again alluded to in its place. The point which now claims the cultivator's attention is the applicability of each individual saline material so as to meet the requirements of any cultivated plant, and herein consists the discovery and establishment of the *science of Agriculture*.

Liquids and solutions are always of doubtful application, because, if incautiously or erroneously administered, plants may be at once destroyed or seriously injured, of which we possess proofs in the pot-culture of exotics; but the case is different when we apply farm and fold-yard, and it may be also deodorized fecal substances; these contain all the elements which come under the second head of meliorators, and as not a particle of undecomposed solid substance can pass into the absorbments of the roots, there is little danger to be apprehended,

unless they are incorporated with the land in too great abundance. Farm-yard manure has stood the test of ages : if prepared with judgment, according to the principles established by chemical discoveries, it will contain all the elements of vegetable organization ; and if by age, or improvident management, it shall have lost its ammonia, become too much carbonized, and, to a corresponding extent *effete*, it can be restored by guano, so far as the ammoniacal salts are concerned. And here, by the way, I venture to suggest that in this manner guano can be employed to the utmost advantage, and without any risk or danger to young seedling plants. All land possesses more or less of organic matter ; it is indispensably necessary that it should do so, otherwise plants could not be supplied with those hydro-carbonous substances which constitute their bulk. Now, farm-yard and other decomposable manures when deposited in the ground (the deeper the better when the straw and other fibrous matter is little reduced) are converted by gradual fermentation into humus—that product of animal and vegetable decay which cannot be imitated by art, but which, by a sovereign law of nature, is inevitably present in all land that is duly cultivated. Hence, and by induction from observed facts, we must insist upon the incorporation of that manure which is supplied by the processes of the farm itself. Fermenting matter must be employed, and the ground is its natural recipient, for thereby heat becomes developed, gases extricated and retained, in a position where they are in close contact with the roots of either vegetables or shrubs, which thus can select and absorb such as are suitable to each. I can by no means admit the theory of Liebig so far as to restrict the nutrition of plants to the absorption of carbonic acid only, whether by the leaves, or by the spongiolets of the roots. The decomposition of humus, or of more crude vegetable matter, must evolve other gases : and as every plant will require hydrogen, and many the compounds of hydrogen and carbon, and of nitrogen, it follows that those gaseous products resulting from fermentation will be duly absorbed and assimilated.

It has been asserted that rotten dung contains more humin (the old name for humus), weight for weight, than fresh dung, and therefore, that if the fertilizing power of manure is in proportion to the quantity of humin which it contains ; and if it can be proved that the quantity of this is as great in black spit-dung as in the more bulky form of unfermented dung, then the concentrated state would certainly be preferable in point of economy every way. The suggestion was plausible, and so far as mere top-dressings were concerned, might be correct ; but as the preparation of humus in the heart of the soil at a considerable depth below the surface, is the object which ought to be aimed at, we claim

the right to believe that every advantage connected with fermentation and its products, will be secured by that proper application of manures which retains the fibrous matter of recent compost heaps replete with animal urine.

I close this article, as land can be injured, and rendered almost barren by a redundant quantity of humus, by which, being glutted, it is made to approach the character of a peat bog, the only certain remedy which chemistry has instructed us to apply, will be quick-lime, reduced pretty nearly to powder, and thus incorporated in sufficient quantity with the soil. By the peculiar affinity with which it attracts and fixes the deleterious humus acid, it will, as before stated, correct the existing evil, and convert a poisonous agent into a gradually available manure.—*J. Towers in Farmer's Magazine.*

ENGLISH FARM.—My next visit was to the county of Essex. I first called on a gentleman, to whom I was introduced, about seven miles from St. Paul's who farms 1000 acres, and who pays, of rent and taxes, £4000 yearly. Although a large breadth of wheat is raised on this farm, it is principally devoted to the cultivation of potatoes and vegetables for the London market. The tenant is a gentleman of large capital and of great enterprise, and conducts his establishment with judgment and economy. He keeps 80 horses for the labour of the farm, and for carrying the produce to the city ; the tolls for which cost him £150 a-year. He employs an immense number of labourers, who are all, except his horsemen, paid by piece or task work ; the total amount of wages paid to them annually exceeds £6000. In 1846, he had 500 acres of potatoes under crop, which were taken up early, and sent to the market before any disease got amongst them, and it was said he cleared £15,000 by the transaction. He plants generally 400 acres of the Prince Regent and Early Shaws species, these being the kinds which bring the best price. Vegetables, such as cabbages and broccoli, of which last he has frequently 70 acres, are afterwards planted. He sows 100 acres of onions, a small part of which is sown in September ; and should they stand the frost, which is not always the case, they are ripe in June and fetch a high price. The usual time of sowing is in March. The two kinds most approved are the white Spanish and the white or brown Globe ; the former meets with the readiest sale, but the latter is the most prolific crop. 8 to 10 lbs. of seed are sown per acre, according to its soundness, which is always previously tested. The yield is from 250 to 320 bushels per acre, of 50 lbs. per bushel, and the selling price is from £3 to £4 per ton. The cost for weeding the onions is £3 per acre. The vegetables, after being reaped, are put in sheds for selection and assortment ; and so much

value being exposed without being protected by lock and key, two night watchmen are kept on the premises. The former tenant on this farm was paid £130 a-year for taking away the dung and spent hops from the brewery of Hanbury & Co., who keep 120 horses; but a competition having arisen, the present tenant pays £50 yearly for the manure. The hops are little valued, and are mixed up with the dung, which they rapidly ferment, owing to their heat when carried away. The grains of the breweries are sold to cowkeepers principally, at 1s. 6d. to 2s. per quarter. No cattle except cows are kept on this farm, and the tenant sells the milk by contract to a public institution at 10d. a gallon—this being the usual wholesale price in the city—which is again retailed at 15d. The Londoners complain much, and not without cause, on the inferiority of the milk supplied to them; but this evil cannot be altogether remedied. Adulteration might, to be sure, in a great measure, be prevented; but, independently of the heterogeneous feeding of the cows, the grass evidently wants some of the properties requisite to produce really good milk, just as it is now ascertained that turnips grown in England are inferior in nourishment to those in Scotland. I was told by a suburban farmer that, the skimmed milk is so inferior that a great part is given to pigs, and, when sold, it brings a half-penny per quart.

GREEN VEGETABLE MANURE.—This has been used for upwards of 2000 years, and in countries where the art of culture has been most attended to. Various crops have been sown with no other view than to be buried in when fully grown, to render the soil fit for crops of more importance. Every species of vegetable in a green state acts more or less as fertilizer, some probably more than others, according to their power of draining organic matter from the air, and inorganic from the subsoil. It is therefore, no detriment to the soil to be covered with weeds, providing they are not allowed to seed, and that they be dug into the ground, instead of being hoed down and raked off, which latter process is a direct robbery of the soil. Green vegetable manure is most effective on the light sandy soils, and least so on peaty lands. It is surprising how much valuable manure is wasted in gardens by carrying it to the compost heap, instead of at once burying it in the soil; and how much is lost or neglected in woods and waste places, from mere indolence, or from want of knowing that rampant nettles and rank growing plants, such as tansy, mugwort, prickley, comfrey, constitute a great amount of the food of plants. Tree leaves and the mowings of lawns are valuable manures, and far too seldom turned to useful account. For using green vegetable manure it should be applied as soon as possible after it is cut. Many crops might be sown for the ex-

press purpose of being dug in when at their full size, and of all garden plants, perhaps there is none better than borage, which yields a very heavy weight of crop before perfecting its seeds.—*An Amateur Gardener.*

STABLES, should invariably be made for a single row of horses only; as when double, the horses are apt to kick one another, to become overheated in summer, &c., and there is more trouble in getting the harness conveniently hung up. The stalls should be made from 5 feet 6 inches, to 6 feet wide, according to the size of the horses kept; the stall boards 9 feet long, and 7 feet high at the horses' heads; the beds 10 feet long to the strand or gutter; the passage behind 6 feet broad, and the height 9 feet to the loft floor, if there is one, or the walls 9 feet high if there is not. A recess should always be obtained if possible, for the corn chest, spare harness, &c., the manger should be 2 feet long, 1½ wide, and 1 deep, placed in the left hand corner, and if of cast metal with a bar across the middle to prevent the horse from throwing out the food with his nose, so much the better; the rack should extend from the manger in a line with it, instead of being placed overhead as is usual, and should be made of spars 3 inches broad, and reach within 6 inches of the ground, and being only 3 feet high, a horse is enabled to eat his fodder in the same manner as he grazes, and this is surely more natural than looking up to the hay loft, like the fox to the grapes, with hay seeds constantly falling in his eyes and ears. A few loose boxes should also be provided for in-foal mares, rearing stock and invalids.

Having the conveniences, &c., farmers may then proceed to breed and rear good stock, and it is of importance that they bear in mind the following ascertained facts—that foals receive *two-thirds* of their character from their sire, and only *one-third* from the dam—hence the importance of breeding from superior males. It is also well known that the sire from which a mare *first* breeds, gives his impression to all subsequent stock bred from the same mare by whatever horse. Old mares, *i. e.*, mares over nine years, also breed more wiry and lasting animals than younger mares, and a large number of the great winners on the turf have been out of *very old* mares—therefore avoid young brood mares, and small boned animals—also *blood* stock, which is little better than gambling in the hands of a farmer, and never pays. Feed mares well while they are in foal; but keep them principally on sealed bran, boiled turnips, barley, or linseed, for some weeks before their time of foaling is due. Captain Apperly, the well known writer on horses under the name of "NIMROD," says, "one half a horse's goodness goes in at his mouth," therefore feed your colts

well, and, if possible, graze them when one and two years old, on low marshy land, as it suits their constitutions, and grows their hoofs into proper size and shape. Good keep in winter is also of as much importance, and is repaid both by the size and form of your stock, and the increased value of their dung. Having proceeded on these principles, a good sound-constituted stock will be obtained, ready for gentle work on the land, but not on the road. At three years old and at four years old, though frequently receiving a check from changing their teeth, they are ready for full work and keep; and, if all right and sound at five years old, they may so continue, if well guided, until they are fifteen.

APPLES TREES, PLANTING, SOIL, &c.

The best soil for apples is a sound, good loam; and if this runs down a couple of spits deep, the ground will simply require trenching. If it is hungry or bad, gravelly or sandy near the surface, the soil must be taken out, two feet deep to do any good, and be replaced with better. If, as it is almost always the case, the top surface for some little depth is good enough for ordinary purposes, the best way to manage is, to throw out from a three or four feet circle the top or good spit or half-spit, as the case may be, to a heap, and dig out the remainder to place on another heap, so that you may pare the top spit all round for some distance to fill up the hole with, and spread about the bad or hungry soil; for, as the tree covers the space in time, and little good comes of the crop under trees, it is better to let the tree have all the benefit. Let the trees be carefully taken up, and if there be any of the roots that strike immediately downwards, cut them off, or at least shorten them considerably before planting. Let all the bruised or damaged and broken ends be cut off with a sharp knife; for nothing tends so much to neutralize the growth of a plant more than damaged roots. Let the holes be filled up to almost a heap; spread the roots all round upon the soil when you place the tree in the ground, and the collar of the plant should be rather above the level of the soil, because however it may be trodden down the earth will settle lower. The ground should be prepared all over before the trees are taken up, so that when they are removed, the roots may not in any way dry, even at the most tender extremities. Supposing the earth to have settled a few days, the holes for the roots have not to be dug very deep, only just enough to admit the roots without bending or breaking them; and selecting a fine day, with the earth in good condition, bruise the soil well to go into the roots, and as it is thrown in by your assistant, lift the tree and shake it or swing it downwards from one side to the other,

so that the crumbs of earth may go between all the fibres, and the whole be trodden solid. In treading them in, remember that the principal place to press the earth down is close to the end of the roots, and not close to the trunk; and when they are fixed, drive stakes down into the ground to hold them fast by means of wisps of straw round the trunk and reversed or crossed between that and the stake, and tied with sack-ties or rope-yarn at the end outside the stake, so that the trunk is grasped firmly by the straw, and the straw being crossed is made to grasp the stake as firmly, and the ends opposite tied fast; care must be taken to drive the stake deep enough into the ground to be firm and steady, that the wind shall have no power over it. The distances for trees in an orchard should be not less than thirty feet; but if the ground is to be used, the trees should be thirty feet apart in the row, and the rows fifty or sixty. In small gardens and limited grounds, where we have no permanent interest, and want immediate advantage, they may be much closer; in fact, so long as the trees have room to grow into bearing, we may limit them, by pruning, to any size we please, because the standard tree may be controlled as easily as a wall tree. Planting espaliers only differs in the form of the tree and the distances; twelve feet apart will do for espaliers in a limited garden, although they could be extended to meet at double the distance. Many have railing on purpose to train espaliers on, but stakes driven into the ground upright in a straight line will answer the purpose; the trees are bought trained on purpose for walls or espaliers, and when planted you have to tie the lower two strong branches horizontally within six inches of the ground, and leave a centre branch, which may be cut to a foot in length, of which the top three eyes may be allowed to grow, two to train out horizontally again right and left, and the third to grow upwards to be cut down to a foot in length, to be treated in a similar way. By this means a good pair of horizontal branches may be made every season until the tree is as tall as it may be wanted. If, however, the tree has been trained a year or two before you have it, you may save all the branches, and bring them down as nearly horizontal as you can; for a well-trained tree, well removed, will be in bearing directly. Espaliers are adapted to limited kitchen gardens, as they may be planted close to the paths, or at the back of borders, next a path, they may be made to separate the quarters, and they seem to occupy no available space.—*Hort. Magazine.*

Riches are but ciphers; it is the mind that makes the sum.

It is the great art and philosophy of men, to make the best of the present, whether it be good or bad.

ON THE AGE OF TREES.

Trees may be considered the most permanent of all natural productions. They exist (as the following list published by Moquin-Tandon in his *Teratologic Vegetale*, translated from *Schleipen's Principles of Scientific Botany* shows) after the most stupendous works of man have crumbled into dust. The following are the ages computed by that intelligent botanist:—Palms exist from 200 to 300 years; *Cereis* 300; *Cherodendron* 327; *Ulmus* (Elm) 355; *Cupressus* (Cypress) 383; *Hedera* (Ivy) 448; *Acer* (Maple) 516; *Larix* (Larch) from 263 to 576; *Castanea* (Chestnut) from 360 to 626; *Citrus* (Lemon, Orange, &c.) from 400, 509, to 640; *Platanus* (Plane) 729; *Cedrus* (Cedar) from 200 to 800; *Juglans* (Walnut) 900; *Tilia* (Lime) from 364 to 1076; *Abies* (Spruce) 1200; *Quercus* (Oak) from 600 to 1600; *Olea* (Olive) from 700 to 2000; *Taxus* (Yew) from 1214 to 2880; *Schubertia* (*Toxodium*) from 3000 to 4000; *Leguminosæ* from 2052 to 4704; *Adansonia* (Baobab) 6000; *Dracæna* (Dragon Tree) 6000.

The ages some trees have attained are even very considerably greater than those, and some in our own country may have existed from 1000 to 2000 years. Pausanias the historian who flourished about the middle of the second century, mentions a plane tree of extraordinary size and beauty in Arcadia, supposed to have been planted by Menelaus, the husband of Helen, which would make the age of the tree about 1300 years.

The date upon which Moquin-Tandon founds his calculations are two; and are thus given in "The Gardener's Magazine of Botany," &c., for last month, viz., "first from historical data, and second from counting the zones." Thus, the colossal Dragon tree of Oratava is known to have existed, in almost its present condition, in 1402; and comparing it with the younger trees in its neighbourhood, its vast age is inferred. The yew trees at Fountains Abbey in Yorkshire, are known to have sheltered the Monks whilst the Abbey was building. The Abbey is now in ruins, but the trees retain their vigour; the lowest age that can be assigned them is twelve centuries; they are probably much more. But where trees have been cut down, the method of counting the zones has been had recourse to. There is no difficulty in this, when the tree is sound; but in many instances, the older trees are the more likely to be decayed in the centre. The plan then adopted is, to take a square inch, count the zones in it, multiply this number by the number of inches from the bark to the pith, which will then give the whole number of zones, and the age of the tree. The number, however, thus obtained, can only be looked upon as approximations to the truth, seeing that the zones of wood vary very much in thickness, not only one with the other, but in parts of the same ring.

Size is no indication of the age of a tree, as various species grow at very different rates, and the same species under different circumstances. The following table shows the different rates, at which some common trees grow:—

	1st Year.	2d Year.	3d Year.
	Ft. In.	Ft. In.	Ft. In.
Oak, circumference,.....	0 10½	0 11½	1 0
Larch,.....	1 0½	1 3	1 4
Elm,.....	2 7½	2 9	2 11
Lombardy Poplar,.....	1 8	2 0	2 3½
Lime,.....	1 8½	1 10½	2 0

Some trees attain an enormous size by their rapid growth. Species of *Eucalyptus* have been measured that reached a height of 250 feet, and measured 70 feet round their trunk.

The death of trees does not appear to arise from any natural period being assigned to the existence of their living tissues, or reproductive powers, "as conjectured by the late Thos. And. Knight." When the tissues of a tree are very old they loose their vitality, especially in the centre of the trunks of the trees; and being exposed to the atmosphere, or moisture, they readily decay. The process of new growth is sometimes more rapid than this decay, and thus trees exist with enormous cavities in their interior. The time, however, comes sooner or later, when a separation takes place between the roots and branches, and then the tree ceases to exist, although the tissue that has been conveyed away from it, in the form of slips and grafts, may still continue to flourish. The number of zones in trees will probably give a tolerable approximation to the years of growth in temperate climates; but even here, two may be formed in one year, if any great check of the growth suddenly occurs during the summer. In tropical climates the indication is far more doubtful; Adanson's computation, made in this way, carried the age of the Baobab's to from 5000 to 6000 years.

AN OLD SCOTCH GARDENER'S VISIT TO A LONDON ASPARAGUS GARDEN.

I called upon Mr Grayson, gardener, Mortlake, in June last, in order to see his asparagus grounds. He is reputed (and justly I think) to be the largest and best grower in England; he has upwards of 50 acres under this crop—a bundle of it containing 150 buds, weighing 37 lbs., was some years ago sent to Buckingham Palace, on the 11th June. I made some inquiries as to the management of it, and was informed that he prepared the ground well by heavy dunging, &c., before planting it; but after this nothing farther was done, unless throwing down the ridges in the fall, and putting them up again early in Spring. Some parts had been upwards of 20 years down, and here the ridges stood highest; the reason for this, I was told, was that the longer it stood the more soil it requires put upon it, as the roots had a great tendency to draw upwards. I said I thought it might do with much

less as I could not see the use of cutting it so long, as at least the one half was unfit for use; the reply was, that it was the custom, and that it would not take so well in the market, if cut short. About 80 people are here employed during the season; it is not uncommon to see upwards of 20 cutters at work at the same time—then there are carriers, porters, tiers, and packers. The instrument used for cutting it is called a knife, but might as properly be called a saw; it is a rod of iron about 15 inches long, $\frac{3}{4}$ of an inch square, having a wooden handle, with 3 inches at the other end flattened out to an inch or more in breadth, set with teeth. This, I consider a good instrument, as by setting it right down by the side of the bud, you are not so apt to cut the heads of those coming up, as with the knife in general use in Scotland, and by which much good grass is destroyed unseen. I may also state that *all is cut; none, however small, are left*—this I said was not the practice in the North, as it was considered better to leave the small for two reasons, that it would not pay the trouble, and also that it was considered better for the plants not to cut them so close. This was granted, but if they were to say to the cutters, you must leave so and so, some of them would leave too many, others too few, so that they just cut all, and stop short a little sooner, and let all that come afterwards grow up. It is all sent to Covent Garden, and during the season, *a three horse waggon load is sent up every morning* from this garden alone, and here I saw them selling it. The smallest is, here, called *ware*, and is put up in bundles of from 300 to 400, and sold so low as 1s. This is used principally for soups; the general run of it sold at from 3s. to 5s. per bundle of 120. It is all assorted into four different sizes; one very large picked bundle of 150 buds, brought 25s., and here, I may remark generally, that all vegetables and fruits brought to the London markets are more assorted, both in regard to size and quantity, and I must say, a great deal more pains and trouble taken with them, so as to bring them to market in the best possible condition, than in our markets at home, and hence the great diversity of price, as with the asparagus (or, as it is there called, *grass*, every word being cut as short as possible), so it is with all other things. They have it to answer all sorts of customers as far as possible. The quantity here from one grower, in one day, I believe, is greater than what comes to Edinburgh market during a whole season. I am aware that many will have doubts as to the truth of what I say; should any such visit Kew Gardens, they can, by a quarter of an hour's walk from them, see the ground referred to, or in Covent Garden during the asparagus season, by going to the south-east corner of the market in the morning, they will see the waggon, and although as I have said, Mr Grayson is considered the greatest

grower, no one can make a run out of London in any direction for a few miles, but will see a large portion of garden ground under this crop, about 500 acres. What becomes of it all is, no doubt, surprising, and more especially to any one who has not been in London; this, however, will be considerably lessened, when they consider that it contains nearly as many inhabitants as the whole of Scotland, where not one in a thousand ever tasted it; there, not one out of the same number but has; besides, great quantities are sent all over Britain. It is not uncommon for the dealers in the market to have orders from a single eating house daily of from 1200 to 1500 heads. I have seen in the same market one man bringing in a threehorse waggon load of turnip radishes alone, and was told by Mr Lee, a respectable market gardener that I visited in June last, that he had sold to hawkers and sent to Covent Garden during the season upwards of 30,000 pots of musk plant. (*Mimulus moschatus*.)

CHEERFULNESS.—Persons who are always innocently cheerful and good humoured, are very useful in the world; they maintain peace and happiness, and spread a thankful temper amongst all who live around them. He that does not know those things which are of use and necessity for him to know, is but an ignorant man, whatever he may know besides.

SEEING WITHOUT SIGHT.—Let a man have all the world can give him, he is still miserable if he has a grovelling, untutored, undeveloped mind. Let him have his gardens, his fields, his woods, his lawns, finely ornamented for grandeur and gratification, while at the same time God is not in all his thoughts. And let another man have neither field nor garden; let him look only at nature with an enlightened mind, a mind which can see and admire the Creator in his works, can consider them as demonstrations of his power, his wisdom, his goodness, and his truth; this man is greater, as well as happier in his poverty, than the other in his riches. The one is but a little higher than a beast, the other but a little lower than an angel!

It is truly a most Christian exercise to extend a sentiment of piety from the works and appearances to the realities of nature. It has the authority of the sacred writers upon its side, and even our Saviour himself gives it the weight and solemnity of his example. "Behold the lilies of the field: they toil not neither do they spin, yet your Heavenly Father careth for them". He expatiates on a single flower, and draws from it the delightful argument of confidence in God. He gives us to see that taste may be combined with piety, and that the same heart may be occupied with all that is serious in the contemplations of religion, and be at the same time alive to the charms and loveliness of nature:—*Dr. Chalmers*.

Agricultural Journal

AND

TRANSACTIONS

OF THE

LOWER CANADA AGRICULTURAL SOCIETY.

MONTREAL, JUNE, 1850.

An "Agricultural Education," or Education suitable for Agriculturists, should, we conceive, be provided for the children of the rural population of Canada. If the Government and Legislature have any thing to do with providing for the education of the people, surely there could be no reasonable objection that the system of instruction should be such, as would be the most useful for each class to whom it would be imparted. In almost all the Nations of Europe, including the British Isles, Professors of Agriculture have been lately introduced in their Colleges. This is one step in the right direction, and giving something like an equal chance to Agriculture, as to other business and professions. The first and most important of all professions, has been long enough left to shift for itself, so far as regards a suitable education for it. Since the failure of potatoes, and the casualties to which wheat is liable, parties begin to think that it may be necessary, that the art of providing food and clothing for the human family should be better and more perfectly understood, to secure a constant and full supply and prevent the calamity of a famine and all the misery experienced in Ireland and other places, the last few years. If there is any moral obligation upon us to practice any art in perfection and to the best advantage it is Agriculture, because it is to a Bountiful Creator we look for the increase and the plentiful harvest, and we are scarcely ever disappointed in our hopes, in proportion as we have done our duty properly. In almost every other business it is our fellow-man

that we hope will reward our skill and our efforts, but it is the Almighty alone who rewards the skill and industry of the husbandman, by an abundant produce of crops and of cattle. There is great encouragement in this idea to the Agriculturist, that it is upon the bounty of his Creator he is dependant, and not upon the inconstancy and changeable fancies of man. It is upon these grounds that a feeling of independence, and superior station should be natural to the husbandman and it is also upon these grounds that his education should be suitable for him as an Agriculturist, and to fit him for the station he should and is entitled to occupy in every community. It is time that Agriculturists should be furnished with all the advantages to practise their business, that other classes have had long ago. It is also time they should be educated for the station they ought to occupy. Farmers are considered as mere labourers by the class whom they so largely contribute to maintain. Useful knowledge, may be, and is power, to those who employ it to the best advantage. Farmers require the knowledge that would be the most useful for them in their business, as well as that which would be required to fit them for their station as respectable members of the community—and both should be imparted wherever it would be possible.

Next in importance to Agricultural Education, is the establishment of Model Farms. We would not hold out any inducement for their establishment, except that they might be made a certain means of giving practical instruction to youth in the art of Agriculture, and afford encouragement to farmers to adopt an improved system of husbandry, by seeing the effects produced by it on Model Farms. This should be the sole object of their establishment. We do not hold out any prospect of realizing any other profit by them. Under judicious and competent management, they might be made to pay their own expenses,

and perhaps, the interest of the capital invested, but we do not believe they would do more than this, and we should not expect it. The country should be well contented if it paid no more than this, for producing the improvement of our Agriculture, and thereby the prosperity of the rural population. The experiment is intitled to a fair trial, and we humbly conceive that at least two or three Model Farms should immediately be established in Lower Canada, one in Quebec, Montreal, and Three Rivers. The quantity of land for each should not, if possible, be much short of 500 acres, even though half of it should be woodland. There would not be any risk, of a loss being sustained, should the farms have to be sold at a future period. The improvements made would be security against this. It would be desirable that sufficient land should be secured in the commencement, should the plan succeed as it must do. Five hundred acres of land would be required for a District Model Farm to show every branch of husbandry in full operation. The expense need not alarm this fine Province, for if she would not be able to bear it, she is far below our estimate of her. We would not propose, that what is understood in Britain as "High Farming," should be the system adopted at Model Farms. A good and judicious system of Agriculture, that every farmer might adopt upon his own farm, would be the most proper and most useful, and the most likely to attain the object sought—the general improvement of Canadian Agriculture. We cannot say, what the land might be purchased for, or what description of buildings might be upon the land, but we are convinced that no farm that is purchased will have buildings suitable exactly for a Model Farm, without alterations, and additions being necessary. We must also be prepared to find the land requiring much improvement, before it can be brought into a state of proper cultivation, and put into a

judicious rotation of crops, yielding profitable products. But in the progress of accomplishing all this, the very best instruction will be being imparted to those employed upon the establishment, and to all farmers who may come to visit it. We must not expect that the moment land is purchased for a Model Farm, there is nothing more to be done but enter upon it at once, and commence a perfect system of Agriculture, rotation, and ample products, with a stock of dairy cows in full milk, and yielding a large return in cheese and butter. The first year will be necessary to put all things in good working order, and provide suitable stock and implements. It would be difficult to provide much manure the first year for a large farm. Indeed, we believe, should a farm be purchased for this purpose, the most judicious plan to adopt would be, to summer-fallow all the land that would not be fit to produce a profitable crop the first year. This would be bringing the land at once into a state of fertility and productiveness, and affording opportunity to clean, drain, manure, and seed it down with the crop for grass, in the course of a year. By no other means could this be so well, and so cheaply accomplished. We should say that there is scarcely a farm in the country that would not require to be summer-fallowed, to break up thoroughly and mix the soil, and take out all roots of weeds. In general, farms have been continually ploughed in the same direction, the same furrow-slice turned over in the process of ploughing, and hence the soil is never thoroughly broken up, and pulverized as it should be. Summer-fallowing, draining, and subsoiling, (where it could be done to advantage) is actually necessary in most Canadian lands. This process, properly executed, would increase the depth of the soil, open it to the influence of the atmosphere, and act most beneficially in fertilizing the soil for future production. As this matter

of Model Farms may come under the consideration of the Government and Legislature, we think it our duty to submit our humble views on the subject as Editor of this Journal. It would be wrong to hold out any encouragement for the establishment of Model Farms that would not be likely to be realized. We humbly conceive that, the general good that they *must* produce to the country under *judicious* and *competent* management, would amply compensate for the pounds shillings and pence expended in their first establishment, without requiring any further profit. The capital expended would be secure in the land, stock, and implements; and the farm, we have no doubt, would pay its own expense, together with the interest of the capital employed.

Every farmer should make as much manure upon his own farm as possible, and he will find it far the cheapest manure he can obtain. There are various ways of increasing the manure upon a farm, if they are only employed judiciously. As regards liquid manure, we conceive the very best and cheapest way of saving it, on ordinary farms, is to provide the cattle and animals, of every species, with abundance of litter while kept under cover. The urine will thus be absorbed, and all that is valuable of it remain, in the manure or straw. It would be a great advantage, also, to keep the manure under cover while in the yard. In case that there are means for collecting the urine, perhaps it could not be better employed than thrown over the manure heap. According to Springel 30,000 lbs of urine contain only 2,250 lbs of manuring matter. Hence the application of urine is a very considerable expense and trouble, if it has to be carted far. If farmers would apply all their straw to littering their animals, or as much as was necessary of it, there would not be much necessity for liquid manure tanks, nor would farmers suffer much loss from not having them. There is certainly

a great waste of manure in most farm-yards in Canada. Indeed manure would appear to be no part of the farmer's care or attention, nor would it seem that he thought manure necessary. On very many Canadian farms, there is not one-fourth of the manure made that should be made. The cattle eat all the straw, and if any stray particles happen to remain in the manure after it is thrown out of the stables, they generally eat it also. Compost heaps might be made upon every farm, that would greatly augment the quality of manure. Upon these heaps, any urine that could be had, might be thrown to advantage. It is in the summer compost heaps should be made. Materials can be easily collected; moss, clay, road-scrappings, lime, ashes, weeds, dung, salt, in fact every substance that can be collected might be made use of. Farmers convenient to towns and villages may, and should collect all the manure they can obtain, but those at a distance from such supplies, should endeavour to have abundance upon their own farm, *and they might have it*. There is no farm under good management that could not supply the manure required; perhaps with the assistance of summer fallow, and ploughing in green manure. There is no excuse for allowing farms to be exhausted, and deteriorated, as there are always means to prevent deterioration. The great want here is skill and capital; and one is as much required as the other. The deterioration and exhaustion of the lands of Canada, should be prevented by all means, and this can only be done by supplying manure to them in proportion to the crops taken from them annually. We regret to say, that in many cases, the crops are very small, but we are convinced that the manure applied is proportionably smaller. Keeping cattle, to consume the straw on the farm, and not giving them other food, cannot keep the land in a proper state of fertility. Our system of farming in a great part of Lower Canada, requires a very great improvement, and to effect this improvement should

be the principle object of solicitude with a paternal government. This country is circumstanced differently from the British Isles. In the latter country, the great landed proprietors have an interest in promoting Agricultural improvement, and will be sure to do all that is possible for it. We have no such proprietors here, and unless the government and Legislature take the matter up, we do not see any great chance of the necessary improvement to Canadian Agriculture. It may be very convenient to leave this matter to private enterprise or private interest; but in that case other interests besides those that are private will be sure to suffer for the neglect. It may be presuming too much for us to speak so plainly on this subject, but we should not act justly to the cause we advocate, if we did not state our convictions as to what is required to accomplish the object for which this Journal is published. We may be in error, but we can only be convinced of this by the most clear demonstration that we are so. This country has incurred a large expenditure on Canals, and purpose to expend more on them and on Rail-roads; and we rejoice at it, but we would much prefer seeing those Canals and Rail-roads fully employed, transporting our own Agricultural products, than those of any other country. Canada is sufficiently extensive to yield products that would give a large business to Canals and Rail-roads; and there cannot be much question as to the profitableness of their being so employed, rather than in carrying foreign products. We offer no objection to the employment of our Canals, &c., in transporting any products they can obtain the carriage of. We only say we would prefer to have them employed on our own farmers' account. Parties may imagine Canada to be unfavourable for this, that, and the other production, but we are convinced it is as capable of producing the food of man and domestic animals, as any part of North America; and if it does not do so at the present, it is the fault of our system

of Agriculture, the want of practical skill in the Science and Art of Agriculture, and the want of sufficient capital employed in farming.

AGRICULTURAL REPORT FOR MAY.

We have never seen the commencement of May more unfavorable for Agricultural operations than the present year, particularly when there had scarcely been any Spring work executed in April. About the 4th of May, the soil was becoming in good order for harrowing, but on the night of the 4th the weather changed, and continued to rain nearly forty-eight hours, producing very high floods in all directions in the neighbourhood of Montreal, and we believe very generally throughout the District, if not further. Never was the necessity of good drainage more manifest than this Spring. We may conceive the advantage that farmers possess in Britain on thorough-drained land, when they do not consider the drainage perfect, unless they are able to work upon it in a few hours after the heaviest rain ceases. We have seen plans of large farms, where every acre that its arable is thorough drained, and where lands that were previously waste are made arable by drainage. Upon thorough-drained farms, the Agriculturist may cultivate every species of crop, at the proper time and in the best manner. In fact he can grow what he pleases, and not allow any plant to grow that is not for his advantage. Thorough-drained land can be cultivated as a garden on a large scale, and may be brought to yield a produce of three or four times the value of insufficiently drained land. It is quite a pleasing and easy work to cultivate and manage thorough-drained land, compared with that which is not so. It never becomes hard by drought, or too soft by excessive rain. The rain passes through it and fertilizes it. The dews have the same effect. The air can also enter the soil, which is so necessary to the perfection of crops. In soil not thoroughly

drained the rain does not pass through it, but remains upon and in the soil, until evaporated by the sun and wind, leaving the soil so hard as to prevent all the good effects of the fertilizing qualities of rain to the crops. This renders the soil impervious to air and dews also—so that rain, dews and air, are comparatively of little use to growing plants on ill drained soils. This is not a theory of the fancy, but a certain fact, that can be proved by a reference to crops growing upon drained and undrained soils.

We are fully persuaded that there is not a greater defect in Canadian husbandry than the insufficient draining of the soil. Its ill effects are perceptible in all directions, from the commencement of the Spring to the end of the Fallploughing. In the sowing of the seed—in the growing of the crops—in the harvesting, and in the ploughing of the land in the Fall, all exhibit unquestionable proofs that the lands were not in the best state for working in proper season, or producing good crops. This may not apply to every quality of soil, but it will to much the largest proportion of the lands of Lower Canada.

The long protracted cold weather in May, has been severely felt by many farmers who had not provided themselves with sufficient winter keep for stock; and we have been told that in many instances the thatch of barns has been taken off to feed the cattle. It may be imagined what nutriment poor animals find in old straw that has been exposed as thatch for many years on buildings. One of the worst features of cattle keeping in Canada is—that very many farmers make no adequate provision for cattle either in summer or winter. In the summer they have to subsist in the best way they can, in ranging over land that was in tillage the year previous, and not sown with any kind of grass seeds or clover, or upon some wild wooded pasture. In winter, they have to live, if they can, on straw, or in fact upon what should be only considered waste fit for

making manure; such is not the proper mode of keeping cattle with any hope of profit to their owners. Straw might certainly be made use of for cattle, if they also were supplied with a portion of hay or roots, but without this, it is absurd to keep cattle in our cold winters on straw alone. It appears as if farmers only kept cattle to consume what would otherwise be waste. In the British Isles, the *very best* of the lands are kept for the pasturage of cattle and sheep, and the best of the produce, with the exception of wheat and barley, is given to them in winter. They are, in these countries, considered the most valuable appendages of the farm, and regarded as the best paying part of the products. Our system is altogether faulty in Canada. We have had constant opportunities of seeing hay sold in the Montreal market for much less than its cost to the farmer. Indeed, for more than half the time we have been in the country, hay has been sold for so low a price, that the purchasers have not paid the farmer the price it cost to cut, cure, and take it to market, so that the land upon which the hay was grown, was in reality the property of the man who bought the hay, instead of the farmer. Under a better system this could never occur, and particularly if the farmer was in circumstances to keep over some of the hay of a plentiful season for a year of short crops, as they do in England. Under a judicious system of husbandry, cattle and corn, hay and pasture, are kept in due proportion to each other; hay is never sold at a very low price, while cattle, perhaps, are half starved upon straw; nor could hay be sold at a very high price if the large surplus of one season was kept over to supply the deficiency of another season; this would be more favourable for all parties, to seller and buyer. There is no excuse for farmers to be short of provender for cattle, when, by a little care, abundance might be grown on lands that are now left waste. When the season was too far advanced to grow a crop of grain that would be

likely to ripen properly, the land might be sown with oats, buck-wheat, Indian corn, or rye, and cut down green, (the oats when in ear), and dried and saved like hay. This would be much better than waiting for a late crop to ripen, and perhaps the whole be rendered useless by rust, except for manure. We propose this plan only for farmers who have not sufficient meadow, or other means of keeping properly a due proportion of cattle to the quantity of arable land. We wish we could convince farmers that it would be their interest to do this, and that the land might immediately be ploughed up after the green crop was taken off, and undergo a sort of half summer fallowing, as a preparation for a future crop; it would be much better to do this, than have it as at present, growing scarcely anything but weeds. A produce, we believe, equal to two or three hundred bundles of hay, might in this way, be raised per acre, at the cost of ploughing and harrowing once, and two or three bushels of oats or rye, or one of Indian corn as seed. Even one acre of roots, such as mangel-wurtzel, swedish turnips, carrots, or parsnips, would also be a great means of supporting the farmers' cattle given with the straw in winter, and this might be easily managed, and the weeding and hoeing be done by the farmer's family. We give the following extract from the "Farmers Herald," on the subject of growing oats for fodder for animals, in order to encourage farmers here to make the experiment:—"I cut a certain acreage of oats before any part of the straw ceased to be green and succulent; it was made into hay, not as hay is frequently made, by exposing it to bleaching, and the destructive action of sun and rain, but by putting it up into small stooks, as is done when the grain is ripe; it thus dried without exposure. This oat-hay was (of course not thrashed) given in the winter to sheep, cattle, and horses, and put in their racks, side by side with the best clover hay; the animals invariably preferred it to the clover hay, leaving that un-

touched; they thrive well upon the oat hay, and its high nutritive qualities are confirmed by chemical analysis. I carefully weighed from the same field a like acreage of ripened oats, and its straw, and the money produce of both kinds is as follows, per Scotch acre:—

An acre of ripened oats gave 36	
bushels, at 2s. per bushel,.....	£3 12 0
150 stone of straw, at 24 lb. to the	
stone, at 3d. per stone,.....	1 17 6
	£5 9 6
Deduct cost of thrashing,.....	0 7 0

Net value of the acre of ripened oats,.....£5 2 6
 The acre of unripe oats gave 205 stone of hay, at 24 lb. to the stone, value as compared with hay 10d. per stone, say 205 stone,.....£8 10 10
 Leaving an increased value of £3 5s. 4d. over the ripened oats, and in addition, saving all the risk of a bad harvest."

We can very well credit the above statement, and it certainly affords great encouragement to try this plan in Canada, where farmers, in many instances, have not sufficient meadow lands. We fear the weather will have greatly retarded the sowing and planting this spring; indeed we do not recollect during our residence in the country more unfavourable Spring weather. We feel this more particularly from the generally defective state of our drainage. Ill drained soil is cold, and becomes dried and baked with the heat and drought of summer, and impervious to air or moisture, unless in long continued rains. Every practical farmer knows the difference of crops grown upon the baked soil we have described, and those that would be produced upon well drained, well pulverised soils, open to air, dews, and moderate showers.

The foregoing part of our Report was written previous to the 20th of May, and we expected

that every day would bring a favorable change in the weather, but up to the 27th it continued extremely unfavorable, and it is a remarkable fact, that we have never seen the atmosphere exhibit any indication of settled fine weather, *for a single hour*, from the 1st of May to the 30th. If we had not a promise that never fails, of "seed time and harvest," we should have considerable cause for alarm, that so much of the Spring sowing remains unfinished at the latter end of May, as it certainly does this year. The worst feature of the matter is, that the ploughed soil will be overrun with the roots of grass and weeds before the seed is sown, and also that lands, remaining so long ploughed, perhaps very imperfectly drained, will become so saturated with moisture that the soil will run together and form a very unsuitable seed-bed, that when dried again will be nearly as hard as a brick. These are consequences that we may expect to result from the weather we have had this Spring. We must not despair, however, of having fair average crops, notwithstanding present prospects are rather discouraging. Farmers should do all in their power to have the seed put in, as well as circumstances will admit. We know that there will be much difficulty in executing the work properly in the short time that remains for doing it, and this is the greatest evil of late seasons, small capital, and high-priced labour. We believe that farmers this Spring have ventured to sow wheat early, where the soil was in a fit state for harrowing, and we hope they will not have any cause to regret having done so. They are, from present appearances, much more likely to have a good crop, than those who have not yet been able to sow. Early sowing would certainly be desirable if the wheat could escape the ravages of the fly, even with partial damage. The experiment will be fairly made this year, and if early sowing succeeds, we shall have cause to be thankful. We have sown at various times from the 20th of April to the 20th of May, and we shall report the result, and we hope other farmers

will do so. It is not yet too late to sow buckwheat and almost every variety of root crop, and we would strongly recommend farmers to sow, as long as there is a chance of the crop succeeding. We have never seen the grass look better or more promising; but it is the month of June that produces the hay crop, and makes it either a heavy or a light crop. It is fortunate that the pastures are green, affording some food even now for the stock, but the ground is so cold and saturated with moisture, that the cattle required housing to the end of May. The trees have been unusually late this year in coming into leaf; we do not recollect to have seen them so late in Canada. It appears, by accounts from other countries, that they have experienced cold, wet weather as well as we have in Lower Canada, so that we are not singular in this respect. This season should be a very useful warning to us, to be always prepared, as well as it would be in our power, for adverse seasons. Doubtless, much is in the farmer's power to guard against an unfavorable season; by ploughing well, and draining sufficiently in the Fall, the land will be in a better state in Spring to work at the very first opportunity of dry weather. If this is not done, while waiting for the moisture to soak and evaporate, rain may come as it has done frequently this year, and wet the soil again, and thus delay the sowing from day to day until too late. We may appeal to every farmer if they have not found this to be the case; and it is certainly very frequently the fault of the farmer that sowing is so often delayed beyond the proper time. The skilful farmer can do much to overcome the disadvantages of unfavorable climate and soil, but we by no means admit that the climate and soil of Canada are unfavorable, but very much the contrary, on an average, compared with any other country we are acquainted with. 30th May.

In our last we stated that although we had very good farmers in Canada, that the very

best managed farm in this Province would not bear any comparison to the best managed farms in the British Isles. If there is any doubt upon this point, we have it in our power to satisfy this doubt, by reference to the "Transactions" of the Royal English and Irish Agricultural Societies, and the Highland and Agricultural Society of Scotland, which can be seen at the Rooms of the Lower Canada Agricultural Society. The Reports, and Plans of British Farming, in these "Transactions," and in Agricultural periodicals, would satisfy any party how far Agriculture is behind that of the British Isles, in every part of North America. We do not pretend that good farming is general in the British Isles, but we do say that where good systems are introduced on farms in these countries, we have none to compare with them in North America. There is no such thing as a whole farm being thorough drained in this country, indeed there is very little thorough draining in North America that we are aware of. A large capital is employed in British farming or they could not have such good crops or stock. This is not the case in Canada, with few exceptions. There is a general want of capital, unless farmers can make it themselves by the help of labour in their own families, and great industry, and skill in its application. We seldom find in this country capital and skill with the same parties to commence business with in farming, and this circumstance is one of the greatest impediments to the progress of Agricultural improvement. Those who have capital may not have been brought up as farmers, and may want the skill required to employ it to the most advantage in Agriculture. On the other hand parties who may have the best practical skill and experience in every branch of husbandry, may not have capital to farm to any advantage. There are other parties who have neither skill or capital, and what are they to do as

Agriculturists? It is from all these causes that our general state of Agriculture is not what it should be. Farmers possessed of skill and capital in the British Isles, are not likely to leave their Fatherland, and all their dearest connections to settle in North America. Losses and disappointments, may induce many to sever all the ties that bound them to home and connections, to seek their fortune in a foreign land, but in most instances they want capital to enable them to farm as they were accustomed to do in the land of their birth. There are cases in which all these various difficulties are overcome, by the energy and good fortune of the parties, but they are the exceptions, not the general rule. The man who has capital, without much practical skill in Agriculture, is the most likely to succeed, if he takes a pleasure in Agricultural pursuits, and is possessed of good judgment, that will enable him to employ the most skilful and efficient labour upon the farm. Such men will very soon acquire a sufficient practical knowledge of husbandry, to enable them to farm very advantageously. Capital applied under such circumstances, will not be wasted, and will produce, by example, much benefit to the public. Where there is means, every work can be executed in a proper manner, under skilful superintendence or by skilful labourers. The most skilful practical farmers, may see a thousand things necessary to be done upon their farms, without having it in their power, from want of capital, to have them executed, and hence they may labour all their lives under these disadvantages, and not be able to overcome them. A defective cultivation and deficient products one year, may cause the same defect a second year, and for twenty years, without some means of overcoming it and curing the defect. We will not say that this is invariably the case, but it is certainly so in a great majority of cases. Some of the most successful settlers

in this country have been brought up to hard labour, and many of them have acquired a good knowledge of farming in the employment of others, which they have turned to good account. These parties, are in numerous instances, in very good circumstances in this Province and in the United States. The secret of their success was—that they had been taught, by labour upon lands of their own or in the employ of others a good share of the practical art of Agriculture, and that their habits were frugal, and industrious. With these qualities, parties can scarcely fail of success in this country, particularly when they have help of labour in their own families. Single men can soon accumulate capital, and men with families who work, can do so likewise and work the farm. These latter parties will not, probably, adopt any high system of farming, but content themselves with such a system as will enable them to accumulate the most property. Very few of them are disposed to advance with the new systems now in progress in the British Isles, or venture upon making any experiments that they are not practically acquainted with. It would be unjust to condemn them for persevering in a system which they are perfectly satisfied with, and which it would be well for the country that all farmers who practice an inferior system of husbandry, would adopt. In the British Isles, rent-paying farmers, are frequently men of large capital, and are able and willing to expend much of it on labour and high farming, and where farmers have not capital, the proprietors of the soil advance money for draining and other improvements, the farmer only paying 5 per cent interest in addition to the rent. These circumstances will account for the superior Agriculture of Britain, and the very large products obtained. A perfect system of husbandry we conceive to be that, which yields the greatest amount of value in products annually, such a system,

we admit, may not in all cases be the most profitable. In all other arts, perfection is considered to be that which produces the greatest amount of value or utility in any particular art; and why should it not be so in Agriculture? If the expenses are too great to accomplish this, there must be something wrong, and there should be means of reducing them to due proportion to the value of the products.

TO RAISE SEEDLING POTATOES WITHOUT THE AID OF GLASS.—Prepare a bed of rich light soil, sow the seed thinly between the middle of April and the middle of May, in drills eighteen inches apart, covering them with about half an inch of fine earth, which will be all the better if mixed with some finely sifted coal ashes. When well up, and about two inches high, about the end of June, thin them to about eight inches, plant from plant, using a small trowel for the purpose, and carefully lifting the intermediate plants which should be transplanted into a similarly prepared bed, eighteen inches row from row, and eight inches plant from plant, give a little water from a fine-rosed water-pot, to settle the earth about them, and, if the sun be strong, shade them for two or three days. When ripe, take them up and store them carefully in a dry cool place, mixed with sand and fine peat mould. Many of them will be a good size. In the following season plant them out in rich dry soil, in rows not less than twenty-eight inches apart, and from ten to twelve inches, root from root, keeping those that most resemble each other in colour and form together. By the end of the second season the seedlings may be tested, and those which are likely to turn out valuable varieties separated from the worthless. We have not cultivated the seed here, but we believe the above method is the best or as good as any that can be adopted. We would recommend strongly any parties who may have saved seed from the apple produced on the potatoe vine,

to endeavour to raise new varieties of the potatoe.

FOOD OF ANIMALS.

Fermentation, which may be regarded as a sort of cooking afforded spontaneously by nature, adds greatly to the nutritive qualities of the substances which undergo this process. It has long been recommended to allow the barley, intended to fatten cattle, to germinate, and this may be regarded at the first step in the process of fermentation, which the grain undergoes when used for making beer. By this means, the saccharine principle becomes more fully developed, while the food is unquestionably made more digestible and nutritious. Hence, cattle-dealers seek with avidity, and employ with great advantage, the residue of breweries, distilleries, and starch manufactories. A part of the grain thus prepared, or its refuse, is used largely for feeding cattle in Belgium, Alsace, and generally in the immediate neighbourhood of all large manufacturing towns. The nutritive properties of the food are further augmented by rendering it sour, or, at least, it tends in this state to render the digestive function more energetic. Hence, the farinaceous substances used for food, especially when it is intended to fatten the cattle, are made in a great number of places to undergo acetous fermentation. Indeed, all the modes of preparation already enumerated are but little useful to animals destined for hard labour. Seasoning renders the food more agreeable to their taste, more digestible, and therefore more profitable. Common salt is probably the most powerful and useful of all substances for this purpose, and hence it is employed almost everywhere with advantage. It sharpens the appetite, excites to drink, facilitates digestion, renders the flesh of animals intended for the table, of a superior quality, and either promotes, or supplies the acidity induced by the second stage of fermentation. All mammalia seek salt with as much avidity in their wild state as in that of domestication, and show a degree of pleasure, which is a sure index of its utility when mixed with their food, and of its power of correcting the hurtful qualities of their aliment when it happens by some accident to have become vitiated.

In addition to those precautions, which are essential to the proper selection and preparation of food for the domestic animals, it is of great importance to regulate the rations or quantity of food distributed to them at intervals, in order that they may be rendered as profitable as possible. The quantity of food ought always to be in proportion to their age, state of health, the violence of their exercise, and final destination, always observing, at the same time, the general principle, that the quantity of the food must be more considerable when it is less substantial, as

any diminution in its nutritive qualities can only be compensated by a proportional increase of its quantity. It is always impossible to determine, in a fixed and positive manner, how much of each kind of food an animal should consume in a given time, because this depends upon a great number of circumstances relative to its species, its race or breed, the peculiar constitution of the individual, its employment, as well as its age and state of health. The daily allowances further change with the very variable nature of their food, the different ways in which it is administered, the state of the atmosphere, the season of the year, and several other circumstances, all of which should be taken into consideration before we can determine their proper daily rations with any degree of accuracy. Hence result the various and contradictory opinions emitted on the subject by most writers who have attempted to fix quantities. Some have laid down, as a principle, that certain domestic animals will daily consume their weight of watery food, such as turnips, beet-root, or green clover; while others have fixed for the same animals a fourth part of their weight of cabbages, carrots, and parsnips, and a fifth or sixth of beet-root, potatoes, and Jerusalem artichokes. There must be, however, a great variation, according to the different circumstances just enumerated. It appears to us that all these matters should be regulated by particular and individual trials, and be left wholly to experience. This is of more real use than the futile attempts made in most practical books to fix quantities, and which only serve to demonstrate the real ignorance of the persons attempting to enforce them. Physiologists, and all who have studied this matter properly, know very well, that although there are certain well-ascertained general laws which regulate the entire animal economy, each individual possesses a peculiar constitution, or *idiosyncrasy*; which more or less serves to modify these laws. Hence we frequently find a disparity of effects resulting from the same apparent or real cause, and these variations show themselves in the quantity of food which animals consume, as well as on a great many other occasions, the explanation of which can only be obtained on the principles already explained.

Along with the really nutritive food, there must always be mixed a certain quantity of ballast, that is, of some coarse and slightly nutritious food, otherwise the sides of the stomach, as well as the intestines, will not be sufficiently distended and stimulated, so as to perform completely the functions for which nature intended them. Unless this condition is rigorously attended to, the digestion, elaboration, and assimilation of the nutritive juices, will always be incomplete, even in healthy and well-constituted animals. It is therefore, a very important error to overload the stomachs of these animals with any

very nutritious food unmixed, even when it is exclusively intended to fatten them.

In respect to the distribution of their food, it is only necessary to notice one excellent maxim, *good food, a little at a time, and often*. They should be allowed to eat quietly and slowly, in order that they may digest the largest quantity of food in the shortest possible time. Regular intervals of feeding should be observed, with occasional fasting, which serves to appetize them, and give an impulse to their digestive organs. They should not, however, be allowed to grow impatient, which occasions a loss of animal force and nutrition. Digestion never proceeds rapidly as long as the animal continues eating. It is only when sufficiently filled that the circulation becomes accelerated, the temperature of the body more elevated, and digestion proceeds with its greatest activity. All these phenomena succeed in the course of a few hours, after which the temperature of the body falls, the respiration becomes moderate, and hunger returns. It is only at this time that more food should be given, in small rations at a time; and when treated in this manner, the animal consumes less, and derives more benefit from its food.

To alternate and vary the kind of food used is always necessary, because the continual use of the same aliment does not sharpen the appetite so well as a judicious selection and rotation. A variety of food serves to stimulate the digestive organs, and prevent that disgust which the same diet continued too long always occasions by its uniformity. Care should be taken, in respect to these changes of food, to avoid a sudden alteration of diet, especially from green to dry food, or *vice versa*, for these are always more or less prejudicial. It is also very important not to overload the stomachs of labouring animals, immediately before they set out to their work, as is too frequently done, for this often occasions indigestion, or at least renders it imperfect or laborious. From want of food or other circumstances, these animals are often obliged to submit to a long fast, which they are always better able to endure in proportion as their food has been the more substantial.—*Rural Cyclopedic*.

POTATO CULTURE.

HAVING paid great attention to the planting of potatoes now for about thirty years, perhaps a few remarks on the manner of planting, may be worth a place in your valuable periodical. The potato is a root that almost every old woman supposes she knows how to plant, but from my experience and observation, I can see there are but few people who know how to plant to procure a *heavy* crop, and the only reason is this, that it costs a little more labor at the outset; but I am positive the crop will pay any reasonable expense in preparing and manuring the land.

Many people plough land in the common way, and also plough their potatoes *in* after that, but such people cannot expect to get a full crop in this way, as in general, ploughing is not done more than from four to six inches, and I am quite positive that this is not deep enough for the roots, which when the ground is broke to twelve or fourteen inches, the roots are sure to find the bottom.

The plan I have followed for years is this, always to trench my ground, let it be good or bad, and at the same time put the dung in as I go along about four inches deep; when I have done this, I draw drills about twenty-four or thirty inches apart, and in the row I put strong sets, from sixteen to eighteen inches apart, and find that by so doing, I can get a much larger quantity to the same ground in general, if the land is any way good, $3\frac{1}{2}$ to 4 imperial bushels to the rod to between 5 and 600 bushels per acre. I am of opinion where the ground is dry, potatoes cannot be planted too soon, I have planted in October and November, about four inches deep, and found them do exceedingly well, and my opinion is, that it would be well to plant the whole of the crop much sooner than is generally done, because when the bulb has sprouted and been rubbed off, it does not shoot so strong a second time. I found last season when the blight struck my potatoes, which were in a fine growing state, that by cutting off the haulm, and shaking a few light dead shavings over the whole of the ground and setting it on fire, that the whole got quite ripe, and not one tuber affected. Now I think this experiment worth trying, as any one may get a little straw, or any light substance and strew over the ground and burn, and I never found any experiment answer so well, as the roots came to perfection, and I have them by me now, quite sound. By the fire passing over the ground stopping the disease, there is little doubt, but the enemy is an insect, but too small to be observed by the naked eye.—*Joseph Young, Diss, Norfolk*.

HORSE CAKE OR BISCUIT.—I have received from Mr. Donald Cameron, 3, Sauchiehall Street, Glasgow, a sample of "horse cake biscuit," made up by a judicious admixture of various grains commonly used for horse-feeding. These cakes are about 3lbs. weight each, and are warranted to consist of only the best ingredients, and these scientifically prepared; three of them are considered quite sufficient to maintain a horse for a day, for all ordinary work, and four of these for a horse subjected to severe work; of course, a proper supply of hay will also be necessary. I have uniformly recommended cooked food for horses, both as economical and of easy digestion; and, I have no doubt, but that the form in which this is offered to the public is well adapted for the general feeding of horses. In

many cases its advantages will be considerable, as, from its portable nature, it may be used in many situations and circumstances in which other forms of food could not be conveniently procured—for example in travelling—feeding in distant fields—in cavalry service, &c. In all circumstances where there is little time to spare, this food, from its requiring but little mastication, and at the same time being easy of digestion, may be very advantageously used. At the late discussion at the Highland Society's meeting, reference was made to the desirableness of feeding horses more frequently than is usually done, and the horse cake or biscuit is well adapted for this purpose. The sample sent was agreeable to the taste, and was readily eaten by various horses to which it was offered.—*W. Dick, Edinburgh Veterinary College.—North British Agriculturist, and Journal of Horticulture.*

DIAMOND DUST.

The wretched are great readers of countenances.

It is good and elevating to believe that there are men who preserve in manhood the boyish bloom of their open-hearted teens, but as it is a rare fortune to meet them, let us honor, cherish, and love them in proportion to this scarcity.

In the natural history of insects, the Grub turns into a butterfly, but it often occurs in the the natural history of man, that the butterfly turns into a grub.

We may safely fix our esteem on those whom we hear some people depreciate.

Often from our weakness our strongest principles of conduct are born; and from the acorn which a breeze has wafted, springs the oak which defies the storm.

Benevolence is addicted to few vices, selfishness to fewer virtues, humility is the low, but broad and deep foundation of every virtue; every day is a little life, and our whole life is but a day repeated; when we are alone we have our thoughts to watch; in our families, our tempers; and in society, our tongues.

When domestic virtues display themselves in the midst of privations, and anxieties, and sufferings; when they shine most conspicuously, they are like the snow-drops and crocuses which unexpectedly peep out of the frost-bound soil to diversify the depth and dreariness of Winter, and give us a cheerful foretaste of the coming Spring.

Every time a man breaks a divine law, he adds a thorn to the rod which he puts into the pickle for his own back.

It is the prerogative of genius to elevate obscure men to the higher classes of society.

Wise sayings often fall to the ground, but a kind word is never thrown away.—*Eliza Cook's Journal.*

PARSNIPS.—The varieties of these that have been described or cultivated are the following:

Common Parsnip, alias *Swelling Parsnip*, *Large Swelling Parsnip*. Roots from 3 to 4 inches in diameter at the shoulder, tapering regularly to the depth of from 20 to 30 inches. Crown generally below the surface-level of the ground.

1. *Guernsey Parsnip*, alias *Jersey Parsnip*, *Panaïs long*, *Panaïs Coquille*. An improvement upon the preceding, the whole plant being larger and finer; roots sometimes 3 feet long, and Dr. McCulloch states that in Guernsey its roots grow to the length of 4 feet. In quality it is much the same as the common Parsnip.

2. *Hollow-crowned Parsnip*, alias *Hollow-headed Parsnip*, *Panaïs Lisbonais*. Leaves, shorter than those of the common Parsnip; roots about 18 inches in length, from 4 to 5 inches diameter at the widest part, ending somewhat abruptly with a small tap root; crown hollow round the insertion of the footstalks, and grows generally below the surface of the ground. The seed should be sown in shallow drills, the drills 18 inches apart, and the plants thinned out to 12 inches from each other; or to 15 inches if very large roots are desired. By good cultivation they have been grown to between 4 lbs. and 5 lbs. weight each. This is the best variety for general cultivation in gardens. The *Forque*, formerly cultivated in Guernsey of the above.

3. *Turnip-rooted Parsnip*, alias *Round Parsnip*, *Panaïs rond*, *Panaïs Royal*. Leaves, few, root chiefly above ground, from 4 to 6 inches in diameter, in shape resembling a round Turnip, with a strong tap root. It is the earliest variety, and will succeed in ground too shallow for the long-rooted kinds.

In the year 1847, I sent some of the potato seed I had prepared the previous year, enveloped in the viscous pulp, and dusted with charcoal powder, to the Council of the Royal Agricultural Society, a result from which was the following report from *Mr. W. Miles, M. P.*:—(see *Journal*, vol. 8, pt. 2.)

“My Dear Pusey,—You may recollect that, early in March this year, some potato seed was distributed amongst the members of the Council; to my lot fell about half a table spoon of seed and charcoal mixed, which I immediately sent down to my gardener, with instructions to him to do the best he could to procure the greatest number of plants, and the largest quantity of potatoes from each plant, so as to ensure a stock of tubers from seedling plants, the parents of which had appeared to have been in nowise infected by the prevailing disease.—The following is the report sent in to me from my gardener:—

“On the 15th of March the seed was sown in a shallow box about four inches deep, and placed in an early vinery; as the plants came up they

were kept pricked off, three in a large sixty-sized pot, and still kept in the vinery until the plants were three inches high, when they were potted off singly in forty-eight-sized pots, and put into a greenhouse, where they remained until the 15th May; then they were planted in the open ground, at two feet distance from plant to plant in the row, and three feet from row to row. In planting, the plants were turned out of the pots with the balls entire, placed on the surface of the ground at the above distance, and the earth then drawn to the plants, leaving only two joints or leaves above the surface; after which they were well watered with a rose-pot, to settle the earth round the plants. About the middle of June, the roots were appearing very strong on the surface, when three inches more earth was added to them, the same system being continued as often as the roots appear on the surface. On the 5th of August, six of the weakest plants were observed ripening off, and were taken up; the others remained in the ground until the 15th of September."—Of the six lots which ripened off and were taken up August 5th, not one was unsound;—out of fifteen, taken up Sept, 15th, there were fifty-eight which showed evidence of the disease,

"The actual weight of tubers thus raised from twenty-one seeds was 44 lbs, 8½ oz., discarding all fractions, say, upon an average, 2 lbs, of healthy tubers to each plant. The number of plants thus raised per acre would be 7,260, which, multiplied by two,—the average weight of the produce of each of these plants,—will give 14,520 lbs,—6 tons 9 cwt, an acre,"

The produce may be considered very great, and the effect of careful nursery-cultivation. Although the tubers, as a first year's produce from seed, were comparatively of small size, yet, taking the result as bushels of 56lbs., there would be to the acre 258 bushels,—E, J, LANCE,

Bagshot, April, 1850,

ON THE CHEMICAL PRINCIPLES OF BUTTER AND CHEESE-MAKING.

Professor Way, delivered a lecture on the Chemical Principles of Cheese and Butter-making, before the members of the Royal Agricultural Society of England, on the 17th ult.

Mr. Way commenced by stating that to understand the circumstances affecting cheese and butter, they must first of all examine the composition of milk. The popular knowledge of milk was that it consisted of butter, cheese, and whey,—at least these were the three parts into which it was usually seen to be capable of separation; but this division of the ingredients of milk left out of the question a substance of whose existence in milk many people were entirely ignorant, but to which, in a philosophical point of view, the greatest amount of attention

was due—he meant the sugar of milk. In a chemical point of view, milk consisted of five parts, butter, curd, milk sugar, water, and saline matter. The diagram on the wall gave the relative quantities of these ingredients in different kinds of milk.

COMPOSITION OF MILK.

	Woman.	Cow.	Ass.	Goat.
Casein, pure curd....	1.52	4.48	1.82	4.08
Butter.....	3.55	3.13	0.11	3.32
Milk Sugar.....	6.50	4.77	6.08	5.28
Saline matter.....	0.45	0.60	0.34	0.58
Water.....	87.98	87.02	91.65	86.80
	100.00	100.00	100.00	100.00

The sugar of milk, it would be seen, existed in considerable quantity in it, equalling in the cow the weight of the curd. In England, he believed it was never prepared for domestic or other purposes; but in Switzerland it formed a considerable article of commerce. Mr. Way exhibited a specimen of milk sugar, and observed that it would be found to possess only a slightly sweet taste, which was due to its very limited solubility. This circumstance prevented its extensive use as a substitute for ordinary sugar, because it could only be employed in the form of a syrup, and required so much water to dissolve it as greatly to reduce the strength of any liquid to which it was added. Now, milk sugar, although by itself, or in solution in pure water, it would keep well, was very liable to change when in contact with bodies having the nature of ferments. Milk was, when drawn from the cow, slightly alkaline to test-paper; but in a short time it became sour and curdled. This souring was due to the production of an acid from the sugar, which had, from this circumstance, been called the *lactic acid*, or the acid of milk. The same compound was formed in many other circumstances, and its production was not confined to milk sugar, but occurred in the other forms of sugar. Thus lactic acid was produced when Cabbage is cut up and allowed to become sour, forming the sour-kraut of the Continent. The sourness of brewer's grains is due to the same acid. Mr. Way exhibited a diagram which showed how easily the sugars could pass into lactic acid.

RELATION OF SUGAR TO ACID.

	Carbon.	Hydrogen.	Oxygen.
Cane Sugar.....	12 equiv.	12 equiv.	12 equiv.
Grape Sugar.....	12	14	14
Milk Sugar.....	24	24	24
Lactic Acid.....	6	6	6

Thus milk sugar was in relation to the acid in question of such composition that one equiv-

alent or combining proportion of it could, without adding to or subtracting from its component parts, produce four equivalents of lactic acid. Now in the natural souring of milk this transformation occurs, but the question arises, how is it brought about? Mr Way had before stated that ferments in general had this power of acidifying milk sugar. It was an axiom with chemists that ferments are substances in a state of decay, and in virtue of that state capable of imparting it to other substances. The difference between a ferment and a fermentable substance was in general this: The body producing a ferment was liable to change by simple exposure to air. The body in which the fermenting process can be induced is not liable to change by exposure to air, but in the presence of the ferment is capable of ready conversion. The class of ferments generally contain nitrogen; the bodies liable to fermentation do not. Mr. Way had collected in a table some of the more important of the proximate principles containing nitrogen, and also some of those which do not contain this element.

NITROGENOUS PROXIMATE PRINCIPLES.

(MULDER.)

	Gluten of Wheat	Casein from Milk.	Fibrin from Blood.	Albumen From Eggs.	From Blood.
Carbon					
Hydrogen	54.75	54.96	54.56	54.48	54.84
Nitrogen	6.99	7.15	6.90	7.01	7.09
Oxygen	15.71	15.80	15.72	15.70	15.83
Phosphorus...	21.93	21.73	22.13	22.00	21.23
Sulphur .....	..	..	0.33	0.43	0.33
	0.62	0.36	0.36	0.38	0.68
	100.00	100.00	100.00	100.00	100.00

NON-NITROGENOUS PROXIMATE PRINCIPLES.

	Starch	Gum	Cane and Beet-root Sugar.	Grape Sugar.	Milk Sugar,
Carbon	44.47	45.10	44.92	40.47	42.57
Hydrogen ..	6.28	6.10	6.11	6.59	6.44
Oxygen	49.25	48.80	48.97	52.49	50.99
	100.00	100.00	100.00	100.00	100.00

Amongst the former would be found casein, the name given by chemists to the principle which is found in the curd or cheese of milk. Casein, as it existed in milk, was in a fluid or semi-fluid state, but most people were familiar with it in the form of curd. If the curd of milk, carefully separated by pressure from the whey, was exposed to the air, it soon began to acquire a putrid smell: in this state it would, if mixed with sweet milk, rapidly cause it to turn sour. The same

thing happened in the case of the natural sour milk; by the exposure of the casein to the air it underwent a change, which enabled it to act upon the milk sugar, converting it into lactic acid. This souring of milk was influenced by a variety of circumstances, to some of which Mr. Way would allude presently; but his present object was to explain and enforce upon their attention the consecutive changes occurring—first, by the action of the air on the curd, and, secondly, by the influence of the ferment so produced upon the sugar of the milk. A right understanding of these changes would simplify and explain the greater part of the phenomena which presented themselves in the operation of the dairy.

It was well known that the most minute precautions were necessary in the management of a dairy. One of the most important of these was temperature. The action of the air upon nitrogenous substances was, in all cases, favoured by a moderate elevation of temperature. Practically this circumstance was well understood and applied in the construction of dairies, which were usually sunk below the level of the earth, and were as far as possible shaded from the direct rays of the summer's sun. The use of water as a means of regulating temperature was also known. The plentiful sprinkling of the walls, the floor, and the benches, being intended to reduce the temperature by the cold produced in evaporation. But Mr. Way thought that, by a little ingenuity, much greater advantage might be taken of this well-known law of evaporation. Thus, for instance, it seemed to him perfectly practicable to imitate in dairies the methods of producing cold which were produced in hot climates. One of these was to cover the openings of communication with the external air by mats kept constantly wet, which insured a cool and refreshing breeze. In many instances where the command of water existed, this practice might be worthy of imitation in dairies. The colour of the walls was another not unimportant circumstance in the formation of dairies. In one instance he had known of a large dairy constructed of wood being painted black, or rather covered with tar. As black is the colour of all others the most absorbent of heat, the results may be guessed. Scrupulous cleanliness is another of the essentials of dairy management—the scalding and cleansing and airing of the milk-pans, and other utensils, being of the first consequence. The reason of this was also obvious; any minute portion of milk left from one operation would necessarily become so changed by the next as greatly to hasten the internal chemical changes in the milk. Another class of phenomena was connected with the extraordinary power of minute and inappreciable quantities of animal effluvia to produce change in such a delicately compounded fluid as milk. Thus, it was a rule never to have a dairy near a stable or

or other bad smell; there must be no drain near it, and the cheese itself should, where possible, be separated as far as possible. In these cases, as indeed in all cases of noxious effluvia, it was believed that excessively minute quantities of decomposing animal matter were carried in the air, rapidly inducing changes of a chemical nature in substances susceptible of such changes. In the case of milk, the phenomena were all referable to the tendency of casein to undergo change, which was much enhanced by exposure to impure air.

Mr. Way said that he had now shortly to call attention to the curdling of the milk. It was seen that the natural scouring was due to production of lactic acid; but in what way did this bring about a separation of the curd? This question was best answered by examining the properties of casein. Casein, or the curd of milk, was but slightly soluble in water, but very soluble in a weak solution of an alkali. In milk, casein was kept in solution by a small quantity of soda, which accounted for the alkalinity of the milk when fresh drawn. Upon the formation of the acid, this latter seizes the soda, thus depriving the curd of its solvents, and the consequence was that the curd was immediately set free. The separation of the curd from the whey was assisted by warming the milk; this was the reason why milk, slightly sour, but not curdled, became so when added to hot tea. If this explanation of the curdling of milk was correct, the same result would be obtained by the use of vinegar or muriatic acid; and Mr. Way showed that these acids would curdle fresh milk. The lecturer then went on to say that he would make a very short sketch of the different operations of butter and cheese-making.

CREAM.—Cream, he stated, was merely a concentration of milk; the butter, by its lightness, rising and carrying with it a certain quantity of casein; it was therefore merely a mechanical separation. Clouted or Devonshire cream was butter with a large quantity of cheesy matter, and therefore less wholesome than ordinary cream. Cream cheese was one step further than Devonshire cream, being a mixture of casein and butter with a considerable quantity of whey not pressed out. To this circumstance was attributable the impossibility of keeping cream cheese sweet more than a few days. There was a method of preserving cream and milk sweet for some time, which was interesting in a chemical point of view. It consisted in the periodical heating of the milk or cream to the boiling point. If this were done every morning or second morning the milk may be preserved for several weeks. In the same way if fresh cream be bottled and well corked, the bottles then placed in cold water gradually raised to the boiling point, it will be preserved for months.

The explanation in these cases is that, by a temperature of 212 deg. Fahrenheit, the quantity of ferment produced by the action of the air on the casein is destroyed; if no further contact of air takes place, the change of milk sugar into lactic acid is suspended; but if the milk be exposed to the air after boiling, a further quantity of ferment is produced, to destroy which, before it greatly accumulates, recourse must be again had to the process of heating.

Mr. Way thought it possible that the bisulphate of lime, the use of which had excited so much attention lately as a means of retarding the fermentation of the juice of the cane, and the beet-root, in the preparation of sugar, might be advantageously employed in the preservation of milk; but possibly the inventor had contemplated this application of his process.

BUTTER.—The separation of butter in churning was considered a mechanical process, but there were one or two circumstances which seemed to favor the notion that chemical action of some kind occurred during the operation. The circumstances affecting the butter were the same as those affecting the milk. Butter was never entirely free from casein and milk sugar. The casein, although it did not exceed one-half per cent. of the weight of the butter, yet was sufficient to make the preservation of butter difficult. The methods of preserving by salting and pressure, were intended to meet this tendency of butter to become rancid—here, again, possibly the bisulphate of lime might be useful. There was a method of preserving butter for domestic purposes described in Mr. Rham's "Dictionary of the Farm" (p. 113), and which was founded on the separation of the casein and the butter-milk. It consisted in melting the butter and allowing the casein and water to separate and fall to the bottom. The solid butter thus obtained was less finely flavoured; but it kept better, and was much preferable to salt butter for pastry, and other such purposes. To remove the turnip taste in butter, Mr. Way recommended either stirring the milk as it is drawn, or the addition of a little saltpetre; or the adoption of the Rev. Mr. Huxtable's plan, namely, adding to each gallon of the milk a table spoonful of the clear solution of half an ounce of chloride of lime (or bleaching powder), in a gallon of water. In respect to the theory of the formation of butter in the cow, Mr. Way remarked that it was believed that although fat, (and by parity of reasoning butter) could be formed from the starch and mucilage of the food, that in the presence of sufficient oily matter it was not likely that any such production of fat should take place; then came the question how far oily foods would increase the yield of butter. It must not be lost sight of, however, that butter consisted of two fats—a solid and a liquid; and,

according as the one or the other predominates the butter was firm or soft; the oils might possibly increase the quantity, but would the quality be good? He would suggest as an experiment of physiological interest, an attempt to feed a cow with a mash in which such a solid fat should be introduced. By proper measures, best known to dairy-farmers, a cow might be made to eat this perhaps, and it would be interesting to know the results on the quantity and quality of butter.

CHEESE.—Mr. Way remarked that the curdling of milk was due as before explained to acids; which combined with the soda of the soluble curd. In general the production of acid in the milk was brought about by the use of rennet, which was a ferment produced by the lining membrane of the stomach of a calf to the air. The use of rennet presupposed of course the destruction of the milk sugar, and therefore the whey was sour. In Germany and Switzerland, and particularly in Holland, the acetic and muriatic acids were used to curdle milk for cheese. Mr. Way exhibited a diagram of the composition of cheese, which would show that although we believed cheese to be dry, it still retained a large quantity of water.

COMPOSITION OF CHEESE, (JOHNSTON.)

	Skim Milk cheese	Doubl Glou- cester	Ched- dar.	North Wilts.	North Wilts. 2dspe- cimen.	Dun- lop-
Water.....	43.82	35.81	36.04	35.58	44.80	38.46
Casein.....	45.04	37.96	28.98	25.00	28.16	25.87
Butter.....	5.98	21.97	30.40	30.11	23.04	31.86
Saline matt	5.18	4.25	4.58	6.29	3.99	8.81
	100.02	99.99	100.00	99.98	99.99	100.00

The relative richness of cheeses was due to the the quantity of butter in them. The rich cheeses were those which it was most difficult to keep. The thorough salting and perfect washing of the curd also rendered cheese liable to change, although, as in the case of butter, every precaution in this direction was unfortunately opposed to the production of cheese of good flavour; those cheeses that keep best, as the Dutch and Suffolk cheeses, being far less agreeable to eat.

Mr. Way wished to make one or two observations upon the effect of dairy cultivation on the land. Obviously by exporting butter and cheese from a farm, we export the same elements as in ordinary wheat, beef, and mutton farming. In addition, however, to the carbonaceous and nitrogenous elements so exported, a quantity of mineral matter, chiefly phosphate of lime, is removed by the cheese and in the bones of the calves.

In old pastures this was never replaced, until the practice of manuring with bones came into use. Bones, as exhibited in the diagram, contain 50 per cent. of phosphate of lime.

The organic part was composed of oil and gelatin, the latter of which was a nitrogenous substance, as shewn in the diagram below.

Now it had been found that 1000 lbs. of milk contain phosphoric acid equal to about 3 lbs. of phosphate of lime. Mr. Curwen found that in a mixed dairy of long and short-horns on an average of four years 3700 quarts of milk were annually produced by each cow. Upon this calculation about 27 lbs. of phosphate of lime would annually be carried off, and that without taking into account the bones of the calves removed. To replace the phosphate of lime $\frac{1}{4}$ cwt. of bones must annually be added for each cow that was kept. By a further calculation Mr Way showed that if the use of bones were to replace the nitrogen carried off in the milk about 15 times the quantity would be requisite that was needed for the replacement of the phosphate of lime.

PLANTING MANGELS AND TURNIPS FOR SEED.—Prepare the land deeply let it be clean and well manured; plant the roots as soon as possible in rows three feet apart, and two feet, plant from plant. Mangels and turnips may be planted in the same field, but a second variety of turnips should not be sown within half a mile of each other.

CARROTS.—The preparation of the land for, and the cultivation of the carrot is precisely similar to that described for parsnips; but the carrot may be sown a fortnight later than the parsnip, whether the seed be prepared or unprepared, and carrots delight in deep, sandy soils. The most approved varieties for field culture are the long orange, Altringham, purple, white, and red Belgian. The white varieties grow the largest; but the red ones are the most nutritious. As Spring food for horses, they are excellent; they fatten cattle amazingly, and they communicate no disagreeable flavour to the milk or butter of cows, and pigs thrive rapidly on them.

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GEORGE SHEPHERD.

Montreal, April, 1849.

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AGRICULTURAL JOURNAL, AND TRANSACTIONS

OF THE

Lower Canada Agricultural Society.

VOL. 2.

MONTREAL, JULY, 1880.

NO. 2.

We have for many years urged the necessity of obtaining the statistics of Agriculture in Canada, with a view of ascertaining its true condition, and its annual products. Supposing that this would be the most proper mode of proceeding, in order that suitable remedies might be adopted for its amelioration, *where improvement would be most required.*

In the year 1842, we published in the *British American Cultivator*, a series of questions, which we proposed should be sent to the Clergy of the several parishes, with a request that they would endeavour to reply to them, or to as many of them as possible. We had previously, by letter, brought the subject before Lord Sydenham, but he took no notice of it.

The following are some of the questions we allude to, with slight alterations, and a few added. The Census taken last year includes many of these questions, or the answers to them, but we humbly conceive there are very material omissions in the Act for taking the Census, so far as regards Agriculture :

Question.

1. Name the Parish ?
2. Extent in Arpents, or as near it as possible ?
3. Number and size of Farms ?
4. Nature and general quality of the Soil ?
5. Nature of the Sub-Soil ?
6. State of the Drainage generally ?

7. Number of Arpents under Plough or Arable ?

8. Usual course of Cropping, and modes of cultivation and manuring for each ?

9. Whether weeding the Crops is generally practised—what weeds prevail most, and do they abound so as to be very injurious ?

10. Number of Arpents in Meadow ?

11. Number of Arpents in Pasture, and state the quality of the Pasture, and what proportion of it has been cultivated and seeded down with grass seeds ? Are the weeds cut down, or are they allowed to mature ? How is water supplied for the cattle ? Is there any shade by trees or hedges ?

12. Number of Arpents waste, but occupied—what proportion is capable of cultivation—whether all is bearing wood—or what else—and what is the value of the wood—and is it kept for the farmers' own use ?

13. Number of Arpents of unoccupied waste—its quality, and suitability for settlement and cultivation—and on what terms attainable for occupation or settlement ?

14. Average quantity of hay, per Arpent, from artificial grasses, and from natural grasses—and is the hay generally well cured—are there much clover or other grass seeds sown ?

15. Number of Arpents, and quantity produced per Arpent of Wheat, Rye, Barley, Oats, Peas, Beans, Buck-wheat, Indian Corn,

and other grains not specified, in the last year. Also, the quality of the samples of each, and whether clean, and of unmixed varieties?

16. What are the varieties of Wheat cultivated—what time sown generally—are farmers in the habit of changing seeds frequently—are the crops liable to injury by the wheat fly, and which is early or late sowing found to answer best—are the crops well harvested, and in good time—how are the crops cut down—and managed subsequently until housed?

17. Are there any Hops—and what number of Arpents cultivated—and what produce per Arpent?

18. Number of Arpents of Potatoes—how cultivated—any manure applied, and how—subject to disease in seed or crop, or not—what mode of cultivation is least liable to disease in the crop—what varieties are cultivated, and which varieties are the least liable to disease—what time planted—and what time found best—Produce per Arpent?

19. Number of Arpents under green crops—how cultivated—what are the varieties—what produce of each per Arpent—and how are the products employed?

20. Number of Arpents in Summer-Fallow—what mode of executing the process—and when commenced, what is the quality of the soil—is Summer-Fallow found to be beneficial to the soil, and to the production of crops—and what crops are generally sown after it?

21. Number of Horses employed in Agriculture and for other purposes, and are the Males generally geldings.

22. Number of Mares kept for work and breeding, and what attention is there given to procure a good race of horses, of pure Canadian or other breeds, and which breed is considered best and most profitable?

23. Number of Oxen kept for work—how are they worked, and are they considered

better than horses for work, and cheapest to keep—what age are they disposed of, and in what state?

24. Number of Oxen annually fattened on grass, and stall-fed, each separately—what degree of fatness do they attain in either case, and how long are they fattening—what description of food is supplied to them when stall-fed—and what average weight are they brought to when sold to the butcher—what distinct or mixed breed is most esteemed.—Are those generally fattened upon grass regularly castrated when calves. Is it oxen that have been worked that are fattened, or to what age are oxen generally kept when disposed of, fat, either grass or stall-fed?

25. Number of Milch Cows kept, and of what description—whether of pure Canadian, mixed, or other pure breeds—which are found the best and most suitable—what average quantity of milk do they produce daily each, and what quantity of milk is required from each breed to produce 1 lb. of butter?

26. Number of Calves raised for rearing, or meat—how many of male and female kept for stock—are the male calves castrated, and at what age—are the calves raised on the cows, or fed out of the pail—and if the latter, do they get all milk—and in what state, or what substitute? How are cattle provided for generally both in Summer and Winter, with regard to provender?

27. Number of Sheep of the long-woolled breeds, their quality, average weight of the carcass when at maturity, and fat, and of each fleece; also value per lb. for the wool, and how generally disposed of?

28. Number of Sheep of the short-woolled breeds, their quality, weight of carcass when at maturity and fat, weight of fleece, value per lb., and how disposed of?

29. Number of Lambs bred in the year, for rearing or for meat, value of the latter when sold—what is the average mortality until weaned per hundred born—are the

male lambs castrated before they are weaned, or when ?

30. Number of Sheep, of all descriptions, sheared in a-year; the breed, quality, and value of sheep generally, and what breed are most esteemed—how are they kept in Summer, are they pastured with other stock—and in Winter, with regard to food ?

31. Number of Swine fattened in a year—what are they fattened upon generally—their ages and average weight—what are the most esteemed breeds—what proportion is sold by the farmers—what price per 100 lbs. would be considered fair remuneration ?

32. What quantity of Cheese and Butter is made in the year—are the dairies good, and suitable, and is the produce of cheese and butter of good quality—how are both disposed of, and at what prices ?

33. What is the mortality in stock annually—Horses, Neat Cattle, Sheep and Swine—what are the prevalent diseases and supposed census—are they under the control of medical skill, and remedies, if applied properly ?

34. What is the state of the Roads—how are they repaired ?

35. What is the state of Water communications, if there are any, might they be made useful, and how ?

36. What is the state of the Farm Houses and Buildings, are they good and suitable generally ?

37. What is the state of Fences, and materials used ?

38. What is the rate of Wages for all descriptions of servants and labourers, and the probable numbers employed by farmers, and their efficiency—state if farm labourers are to be had at all times to meet the demand for them, as ploughmen, and for other work ?

39. State if there are any Domestic Manufactures carried on—describe what they are—their extent and value of their manufactures annually—also the number of per-

sons employed in them, if hired, the wages they obtain—and if not hired—what they are able to earn by their labour ?

40. Give any other useful information that will have a tendency to show the true state of Agriculture in the Parish, and particularly as regards capital, and the want of it ?

40. Do you suppose the establishment of a Model Farm in each County would be calculated to advance the improvement of Agriculture, if under good management ?

41. Do you suppose the introduction of suitable Agricultural Works, for reading in the Country Common Schools by the children of the rural population, would be advantageous ?

42. What description of Farm Implements are generally made use of—and are they numerous and well adapted to the uses they are employed in ?

43. What is your opinion of the benefits of the County Agricultural Societies to the improvement of Agriculture in your Parish ?

44. Do you consider it possible to introduce improvements in the present system of Farming practised in your Parish, that would very much augment the annual produce ; and how would you propose that this improvement could be best effected ?

We submit the foregoing questions for consideration, and we beg that parties who are friendly to Agricultural Improvement will reply to them. We do not expect that any one party can reply to all, but we are convinced, that a reply to our questions would be very advantageous to our Agriculture. It would show the true state of farming in Lower Canada, and we could better propose and introduce the ameliorations required. We may have omitted many necessary questions, which we hope other parties will supply, and we may have proposed questions that are not necessary.

If other parties take as much trouble in answering the questions, as we have done to make out those we conceived necessary, much good will result from our united labours. No true patriot will decline to reply, if they are capable of doing so. It is not right to shift our duty to our country upon other parties, rather than perform it ourselves, and this is constantly done in Canada, particularly in everything connected with our Agriculture. We trust it will be no longer the case, but that every true friend to the country will unite in doing all in their power to promote the improvement and prosperity of Agriculture.

THE STATE OF AGRICULTURE IN EUROPE.

By James F. W. Johnston, F. R. S., &c.

ITALY.—From Holland turn for a moment to Italy, in which country drainage works somewhat akin to those of the Dutch, form the proudest monuments of which even that famed land can boast, of the victory which persevering intelligence can achieve over the difficulties and seeming hostilities of nature. Did time permit, I might present to you a most interesting historical sketch of the changes in Agricultural condition and capability which that country has undergone from the period of the ancient Etrurians to the present day. And to the man of science, such a sketch would be the more interesting, from the circumstance that in all the changes which have taken place, the physical and geological structure of the country, has exercised a far more prominent influence than either the remarkable industry and constructive skill of the Etruscan inhabitants, or the hostile incursions of its foreign invaders. To the rich alluvial plains of Lombardy, of which rice and Indian corn and wheat, and abundant milk are the natural productions; and to Tuscany, in which something of the ancient industry and persevering practical skill of the old Etrurians still survives, the agricultural enquirer must proceed, to see the bright side of Italian cultivation. But it is in Tuscany chiefly that he will find the most interesting evidence of the conquering power of the living mind over the obstacles of physical nature. The Maremme of Tuscany and the marshes of the Val di Chiama, like the Campagna and Pontine marshes of the Roman dominions, have long breathed forth that pestilential malaria which, like the Summer exhalations of the sea islands and river mouths of your southern states, carries on its wings fever, and lingering ague, and fie-

quent death. It is one of the great modern triumphs of engineering skill, applied to the promotion of rural industry—second only to the gigantic labours of the Dutch, of which I have spoken, and to the artificial drainage of our English fens—that the terrors of the Maremme have in a measure been bridled in—that the Val di Chiama, in so far as it lies within the borders of Tuscany, has been drained and dried—and that cheerful health and rich crops prevail over large tracts of country, in which it used to be almost certain death to linger.

FLANDERS AND BELGIUM.—In Flanders both Belgian and French, you are probably prepared for an admission on my part, of great agricultural skill and success. I am compelled, however, to confess my own impression to be, that a great proportion of what has been written upon Flemish husbandry partakes of the character of a romance. The cultivators of Belgian Flanders have the merit of raising fair crops from certain tracts of poor and sandy soils, of husbanding and applying manures so as to keep such land in culture, and of skilfully varying their crops so as to prevent a premature exhaustion. But no knowledge of the general principles of Agriculture is widely diffused among them. The improvement of wet and heavy clay soils, except by open ditches is almost unknown. Improving implements and thorough drainage, and modern modes of manuring and some small instruction at least in the elements of science as applied to agriculture, have still to be introduced among them, before they can rank in general knowledge or in skilful practice with the farmers in Scotland or England. And indeed, in Belgium as in France, the progressive subdivision of property opposes a growing obstacle to that general amelioration of agricultural practice which the wants of a numerous people and the progress of knowledge demand. Where the average extent of properties and farms over a whole province is already reduced to about an English acre, we cannot look for the introduction of any of those improvements which demand the purchase of new or comparatively costly implements, and rearing and feeding of multitudes of stock, the employment of hired labour, or generally the application of capital to the land. As in Ireland, the subdivision or morselling of the tillage farms, has already, in whole districts, been carried to the starva-limit. As into Ireland, the potato failure brought with it into Belgian Flanders, famine and disease, and large emigration—and notwithstanding all that wise governments can do, it is to be feared that on the recurrence of similar visitations, similar social evils will in both countries again re-appear.

FRANCE.—In France I need hardly inform you, that practical agriculture is far in arrear. In Normandy the mixture of Teutonic blood has probably some connection with the super-

iority of the husbandry of this province as compared with most of the other parts of the kingdom. It is certain at least, that notwithstanding the many efforts made by persons in power to promote the introduction and adoption of better methods, the general farming of La Belle France advances with comparative slowness. This country indeed presents another striking instance of the small connection which may exist between the existence of extensive means of agricultural instruction, provided by the central government, and the practical skill of the rural population. In 1813 there existed in France one hundred and fifty-seven agricultural societies—six hundred and sixty-four agricultural committees—twenty-two model farms, some of which had schools attached to them—and fifteen schools and chairs of agriculture and agricultural penitentiaries. In the early part of 1849, under the auspices of the republican government, and as part of the plan of M. Fouré, then Minister of Agriculture, twenty-one farming schools had already been opened—a national agricultural university was about to be established on the farms in the little park of Versailles, and a hundred and twenty-two agricultural societies, and three hundred minor institutions, had participated in the funds voted for the encouragement of agriculture. Though it is unquestionable that the country may attain a high rank in agriculture without the aid of normal agricultural schools—provided, as in Scotland, other early mental training is placed within the reach of the rural population—and that in spite of numerous schools, if other obstacles intervene, the cultivators of the country may lag far behind:—yet both common sense and experience show, that of two nations of the same blood, placed otherwise in the same circumstances, the one which teaches the principles of agriculture in its schools, will exhibit the most productive harvests in its fields; and that, as in England and Scotland now, a time will come in the agricultural history of every country, when old means and methods will fail to maintain the rural community in a flourishing condition, and when every new means of fertility which advancing knowledge can supply, must be made generally known, and become generally employed. Such are the simplest and most common sense arguments in favour of agricultural teaching—the inutility of which might be argued with some show of reason, from the comparatively small progress yet visible among the fields and farmers of France and Bavaria. The agricultural statistics of France, which the government has collected and published in great detail, would supply many interesting subjects of reflection, were I at liberty to dwell longer on this part of Europe. I may only mention—as pregnant with thought and instruction in regard to the condition, the food, and the general mode of living of the

rural classes of France—the fact that the number of conscripts who are rejected on account of deficient health, strength and stature, is constantly on the increase; that forty per cent. are turned back from this cause; and that though since 1789 the standard has been three times reduced, as large a proportion of the conscripts is below the required height, (now five feet two inches), as ever—(Rubichon.) Such facts as this show how closely the discussion of agriculture is connected with that of the most profound social evils.

SWITZERLAND.—To Switzerland, I only allude as one of those countries in which the influence of national intelligence and a fair share of early instruction, has been brought to bear most successfully on the improvement of the soil, and especially of the breeds of stock which are best adapted to its peculiar dairy husbandry. Those advantages which require the application of capital and science, such as thorough draining and special manuring, are there, however, still unmade; and it will probably be many years, before, in these respects, the cultivators of the Swiss vallies and mountain slopes, can closely imitate the present improved practices of the British Islands.

SPAIN.—The agricultural condition of Spain, suggests melancholy reflections. The central table lands of this country are reckoned among the finest wheat growing districts in the world. The culture is rude and imperfect. The soil is scratched with a primitive plough, and is seldom manured, yet the returns are said to be prodigious, and the quality of the grain excellent. But where nature does much, man too often contents himself, with doing little. Amid all this plenty, the peasant is miserable. He lives in a cabin of baked mud, or in burrows scooped out from the friable hillocks, ignorant of the luxuries of furniture, and barely possessing the necessaries of life. The want of roads and of means of easy transport, makes his produce almost worthless, so that a comparatively spare population exists, and such wretchedness in the centre of fertile fields and a land abundant in corn. We sometimes think ourselves unfortunate to have been born, or to be doomed to live where clouded suns impart a lessened light and heat; or where the frosts of Winter bind up for many months the hardened earth. Yet in such climes, man more really lives, and exercises a truer dominion over inanimate things, than where tropical skies appear to prepare him for a unceasing enjoyment. Where mind and mental energy are dormant, he only vegetates, or exercises his brute passions. Where by perpetual struggles he subdues the adverse elements, bends circumstances to his will, forces a copious abundance from an unwilling soil and in spite of inclement seasons—there he most truly lives, and amidst his hardships enjoys life most; there refreshing sleep visits him with

her balmiest breath, and in the power of mind over matter, which his success displays, he brings out more clearly the claim of man to a likeness with Him who is all mind, and to whose slightest intimation all matter bends.

ON THE ABSORPTION OF CERTAIN NOXIOUS MATTERS BY THE SOIL.

The effect of covering decomposing organic manures with the soil, is known to a certain extent by every farmer. It retards their putrefaction, it thus renders their gaseous emanations more serviceable to plants, and also less noxious to animals. These conclusions most persons had arrived at, who for a moment had thought upon the subject. But that any portion of the soil should have the power to absorb any of these noxious matters, and store them up as it were, for the use of plants, was not till the late valuable examinations of Professor Way, even suspected. Now, however, that he has found that alumina possesses this power, several other circumstances are remembered bearing somewhat upon the same subject. It has been for a long period known that charcoal possesses the power to which I have alluded. Every sailor who has been used to long sea voyages is aware of the power possessed by charcoal, to absorb the products of putrefaction from impure water, and even from tainted meat. The effect of burying in the soil for a few hours tainted meat is also well known to be beneficial. It has long been known to the preparers of artificial manures, that the very impure charcoal produced by charring the clayey mud of the Thames, when mixed with nightsoil, produces the same deodorising effect; its noxious matters are absorbed—the mixture becomes devoid of smell and harmless. This was naturally attributed to the presence of the considerable portion of charcoal which this charred mud contains. Its other chemical ingredients were disregarded. It is certain that the proportion of various gases absorbed by newly prepared charcoal is very large, and this action seems, according to the trials of M. Saussure, to be analogous to the capillary attraction of liquids by very small tubes. It is worthy of notice, when we are thus considering the power of charcoal, that of all the gases tried by this celebrated chemist, ammoniacal gas was absorbed by charcoal in the largest proportion. Thus, supposing the volume or bulk of the charcoal to be equal to 1, the various gases were absorbed in equal volumes or bulks equal to the figures set against their names (Thomson, vol. 1, p. 227).

Ammoniacal gas.....	90
Sulphuretted hydrogen.....	55
Carbonic acid.....	35
Carbonic oxide.....	1.75
Hydrogen.....	9.42

The absorption of gases by newly-made, charcoal seems to terminate at the end of 24 hours; but then it appears that if charcoal already saturated with any gas is put into another gas, it gives out a portion of the gas already absorbed, and absorbs a portion of the new gas. The effect of different soils in retarding the progress of decomposition has lately engaged the attention of the General Board of Health, and these distasteful researches have shown that the progress of decay varies considerably in different soils and situations, and that as a general rule, putrefaction goes on the most rapidly in light dry soils (that is, in those where alumina or clay is in the smallest proportions) and also where the roots of growing plants exert the most considerable influence. The commissioners, in a recent valuable report on a general scheme for extramural sepulture, P. 117, remark—"From the concurrent testimony of grave-diggers, sextons, and others, employed in church-yards, it appears that decomposition invariably goes on more rapidly near the roots of trees than in any other part of the burial-ground—that the earth is always much drier near the roots of trees than elsewhere."

The good effect upon plants of this recently discovered power of alumina to absorb noxious emanations is illustrated by the remarks of M. E. Lucas on the action of charcoal powder, as observed in the trials made with it in the Botanic Garden of Munich (Leibig's Org. Chem., p. 210), the excellent result of whose absorbent powers he attributes, amongst other things, to its preserving the parts of the plants with which it is in contact whether they be roots, branches, leaves, or pieces of leaves, unchanged in their vital power for a considerable period, so that the plant obtains time to develop the organs which are necessary for its further support and propagation—thus keeping the soil free from the putrefying substances which are often the cause of the death of the *spongiola*.

It is, then, most fortunate for the productiveness of the soil, that any portion should possess the power of absorbing and storing up, as it were, these disease-engendering emanations, which, without this beneficent provision of its Divine Author, would render even the burying of decaying substances no remedy for their offensive and noxious effects. It offers, too, for the practical farmer, another reason why all organic manures should be ploughed into the soil as speedily after they are spread over the surface as possible—that the alumina of the soil may be thus enabled to absorb and store up in the soil for future crops, what otherwise would contaminate the atmosphere, lessen the amount of riches of the farm, and thus, instead of producing food, cause disease and misery. The trials of Professor Way, to which I have alluded, were made upon the fluid of the London sewers, and the even more noxious liquid produced in the steeping of

flax. Those important experiments were repeated before the Council of the Royal Agricultural Society of England. On this occasion he placed on the lecture table some glass filters containing a red soil, from the estate of Mr. Pusey, in Berkshire. This soil filled the jar to the extent of five or six inches. Upon one of these the lecturer poured some of the London sewer water; to another he added the fetid flax water. Both of these liquids were turbid—both highly-coloured, and equally offensive to the smell. As soon as they were passed through the soil, however, and began to drop from the jar, the auditors noticed that a remarkable change had taken place; the liquid had now only an earthly smell, such as that which commonly attends the water from soils—but the fetid smell had disappeared. It then became an interesting question to ascertain to what portion of the soil this change was to be attributed. Was it the sand of the soil, or its clayey portion, that was the cause of this rapid purification? The course taken by the Professor pretty clearly decides that it is to the clay that we must attribute this important alteration. Thus some putrid cow's urine, passed through a filter of fine sand, had its mechanically suspended matters removed, it is true, but its fetid smell remained; but when another portion of the same putrid urine was passed through a mixture of the white sand mixed with one-fourth of its weight of white clay in powder, the result was now very different—not only the colouring matters, but the smell of the putrid urine has disappeared. And still further to insure accuracy in the inquiry, another mode was adopted: instead of using the mixed sand and clay as a filter, some of the same mixed earths were added to some of the putrid urine, and after being well mixed by stirring, allowed to subside; the fluid, when this was done, became equally clear, and equally free from smell. These fetid exhalations from such impure decomposing fluids are chiefly composed of various gases, in which ammoniacal gas, carburetted hydrogen, sulphuretted hydrogen, carbonic acid gas, &c., abound. Now of all these emanations, the most valuable to the farmer, and therefore the portion the most desirable to retain, are the salts of ammonia. It is a happy circumstance, therefore, in the economy of nature, that clay has the power of absorbing ammonia from the water in which it is deposited. The Professor found that the clay of a soil has the power of not only absorbing ammonia but the alkalies, potash, soda, magnesia, &c. If a quantity of ammonia, highly pungent to the smell, was thrown upon a filter of clay or soil, made permeable by sand, the water first coming away was absolutely free from ammonia. Such was the case also with the caustic or carbonated alkalies, potash, or soda. This very wonderful property of soils appeared to him as an express provision of their Creator. A power, he re-

marked, is here found to reside in soils, by virtue of which not only is rain unable to wash out of them those soluble ingredients forming a necessary condition of vegetation, but even those compounds, when introduced artificially by manure, are laid hold of and fixed in the soil, to the absolute preclusion of loss either by rain or evaporation.

And again, as might have been reasonably anticipated, the same results were shown to occur when, instead of adding the ammonia to the soil in a state of solution, it was produced in the soil by the decompositions of one of its salts. This, it may be well to remember, is the real explanation; for it would be a great mistake to conclude that the clay of the soil has the power of decomposing the sulphate or muriate of ammonia, which were employed in the experiments of Professor Way. For instance, he found that sulphate of ammonia, when filtered through a soil, left its ammonia behind, but the sulphuric acid was found in the filtered liquid—not, however, in the free state, but combined with lime; thus sulphate of lime was produced, and brought away in the water. In the same way muriate of ammonia left its ammonia with the soil, its acids coming through in combination with lime, as muriate of that base. The same is true of all the salts of the different alkalies, so far as he had yet tried them. Thus lime in the economy of nature is destined to one other great office besides those which had already been found for it—it is the means by which the salts ministering to vegetation became localised and distributed through the soil, and retained there until they were required for vegetation.

The extent of this power, Mr. Way found, was about equal to two grains of ammonia to every 1,000 grains of a loamy soil—an extent of power more than equal to any thing that the farmer is likely to require of it. The weight of the soil ten inches deep being equal to about 1,000 tons, that weight of earth would absorb about two tons of ammonia, a weight far beyond any probable extent of publication of this valuable fertilizer. These chemical discoveries of Professor Way, the intelligent English farmer will regard as another great step in the advancing knowledge of agricultural chemistry. They are further evidence of the error under which we have so long laboured, in concluding that cultivated soils are a mere inactive mechanical mixture of various earths and organic matters, since it is evident that they possess chemical powers full of interest and instruction to their cultivators; and when the great farmers, to whom I have so often ventured to address my observations, are considering these things, they will not forget to feel assured, that many other mysterious processes, not yet revealed to us, are going on around us in the soil we cultivate and in the air we breathe, whose discovery and application will hereafter reward the labours of many a fe-

generations of enterprising and enlightened English agriculturists.—*Bell's Messenger*.

MANUFACTURE AND APPLICATION OF PEAT CHARCOAL.

Much inquiry has been made lately at this office, about the manufacture of peat charcoal, and its application as a fertilizer. From time to time all the most valuable and interesting information which could be collected respecting this new manure, has been given in the pages of the *Gazette*, with the hope of inducing those at whose doors this valuable treasure is to be found, to turn it to the best advantage, not only for their own use, but to manufacture it in sufficient quantity for sale to those living at a distance from, and not being proprietors of turbary, the latter of whom are frequently making inquiry at the office of this paper as to where it can be bought, and its price, of which it is not in our power to give any information.

From the indefatigable exertions, ability, and persevering efforts of Mr. Jasper Rogers, the value of Irish peat charcoal is now fully known and appreciated by the most talented and scientific men in England and Ireland, both as a fertilizer and inodorizer, it having been demonstrated at several public meetings held in London, and several places throughout England and Ireland, that, by the aid of peat charcoal, all excretory matter may be almost instantaneously converted into a dry, inodorous manure, and fit for transport, by any conveyance, without being offensive; and, as a fertilizer, it has been admitted, after trial by the most competent authorities, to be superior to guano.

Mr. Rogers exhibited several sample-bags of this manure, at the late cattle show of the Royal Dublin Society, each containing 1 lb; some of which are to be seen now in their Agricultural Museum; and has also sent fifty of these bags to this office. The charcoal—of which this manure has been in part compounded—has been manufactured at Derrymullen, on the Bog of Allen, and, on the outside of these sample-bags, are printed the analyses of Irish peat charcoal, by Professor Phillips, and also that of the sewage matter with which it is mixed in equal quantities by weight, by Berzilius, Bousingault, and Leibig which are as follows:—

IRISH PEAT CHARCOAL (BY PROFESSOR PHILLIPS).

Carbon,	79.24
Hydrogen,	2.20
Nitrogen,	0.54
Oxygen,	6.44
Sand and clay,	2.48
Oxide of iron,	1.66
Phosphoric acid,	0.34
Silicate of potash,	0.98
Chloride of sodium,	2.53
Carbonate of lime,	1.85

Sulphate of lime,	1.44
Loss,	30

100.00

SEWERAGE MATTER (BY BERZILIUS BOUSINGAULT, LEIBIG.)

Phosphate of ammonia	Sulphate of potassa
Phosphate of lime	Hydrochlorate of ammonia
Phosphate of magnesia	Free Lactic acid
Phosphate of soda	Urea
Phosphate of iron	Uric acid
Chloride of sodium and alkaline sulphate	Animal matter
Sulphate of lime	Mucus
Sulphate of soda	Earthy phosphates.

The quantities vary, according to circumstances.

Wood charcoal, in fine powder, has been known long as a most excellent manure. The details of several most conclusive experiments in the Botanic Gardens of Munich, by M. Lukas, we have given, vol. 8, page 490; and M. Rogers, in his report to the Irish Relief Commissioners, acknowledged that he was first attracted to the action of charcoal on vegetation, by hearing the above paper read at the Royal Victoria Gallery in Manchester. From this he dates his experiments, which have lead, to the most satisfactory and conclusive results. Peat charcoal has been tried alone against well made stable manure, by Mr. M'Kenzie, with turnips; both crops were good, but that grown by the charcoal exceeded the dung by one third. The late Mr. Russel, of Dunlewey House, Co. Donegal, tried peat charcoal with all the usual crops, with uniform success; but his trial on a field of four acres of potatoes in 1847, was the most remarkable. They were planted in lazy-beds, one-half the field manured with farm-yard manure; the other with peat charcoal only; about a handful to each seed. The result was, that he was astonished with more than a double crop from the charcoal; so much so, that he requested Lord Donegal to see and vouch it. At the suggestion of Mr. Rogers, cats were sown on the whole field the following year, without any other manure; and the increase in that portion of the crop sown where the charcoal was applied, over that dressed with farm-yard manure, was nearly in the same proportion as that of the potato crop.

Mr. Newton, of Mount Leinster, county Carlow, found that by dressing with peat charcoal before the second earthing, a certain portion of potatoes planted in drills with the usual dressing of manure, that he had not only nearly a double crop, but that there was not a taint amongst them, whilst those undressed with the charcoal were, more or less, diseased. His Swede turnips, sown in June, manured only with peat charcoal, could not be exceeded; while, from continued drought, all those of the neighbourhood failed.

Peat charcoal alone is a cheap and lasting manure; but mixed with night-soil, sewage matter, or the drainage from stables or cowhouses,

is superior to guano (even the best) in lasting effects, and the use of it will prevent that fearful disappointment and loss which result from the imposition of adulterated guano.

It is much to be regretted that Mr. Rogers, or rather the Irish Amelioration Society, do not manufacture and open convenient marts for the sale and supply of this most valuable substance; in the meantime, private parties, whether proprietors or occupiers, should set about it now, and prepare charcoal, both for present use and that of next season. The manufacture is simple, and within the capacity of the humblest peasant; its preparation being known for ages in the wildest and most remote districts of our island, being the only fuel attainable by the country blacksmiths.

The peat being previously cut and dried, it is made into conical heaps, about six or eight feet wide at the base, and tapering up to six or seven feet high (if they are made larger they are not so manageable as those made of the above size); the sods, or turves, should be set on end in forming the heap, and if the fire is not applied in the formation of the heap, a small chamber should be left in the centre, open to one side, for the introduction of the igniting materials; as the fire gets a good hold, more peat is built about the ignited mass at intervals, so as to keep the fire from making its appearance, or bursting out at the sides or top. As soon as the heap is made of a convenient size, as already described, and that the interior presents the appearance of each sod being thoroughly red through, some finer peat-mould or dry dust should be applied to cover the heap all over, which will prevent the fire from breaking out to the surface, which must be prevented by the addition of more covering wherever there is any indication of it so doing. When all is thoroughly charred, the heap is pulled down by long iron-handled drags made like grapes; or muck-hawks with the tines bent or turned down, and the red sods immediately extinguished by throwing water over them, which should be previously at hand in sufficient quantity; water should be supplied till the turves are completely extinguished, for if the fire is not put out, the mass, when exposed to the air, will burn to ashes, and, as a consequence, be lost. When the charring process and the quenching are finished, the charcoal should be stored in a dry place, and kept from damp: in case there is no shed or house-room to spare, make it up in long heaps, brought to a point at the top like the roof of a house, and thatch it securely, digging a trench round it to carry off the water and keep the floor dry.

Mr. Newton, of Bagnalstown, adopts an excellent plan for extinguishing and grinding the peat charcoal into powder. When sufficiently burned the heap is pulled down, and the red hot turves spread over a hard floor, and a very heavy metal roller passed over them, which at once

puts out the fire and converts the whole mass into a fine, black powder fit for immediate use.

No accurate estimate can be formed of the produce of charcoal from a given quantity of fresh dug or dried peat, from the great difference there exists in the qualities, as regards either bulk or weight; but in a general way it may be said on the average, that the bulk, when dug, is reduced in drying and charring to one-fourth.

The quantity necessary, must, of course, vary according to circumstances. Alone, it is a powerful fertilizer, particularly if ploughed in in the Autumn; and as there is no danger in giving too much, it may be given in any quantity most convenient: used with drilled crops, a ton—which may measure in or about forty bushels—will suffice.

Peat charcoal alone, yields fine crops of carrots, parsnips, turnips, mangel-wurzel, and potatoes; and is a superior top-dressing for grasslands. In no case has it failed in trial with other manures; and when to it is added all the valuable elements contained in human or other excreta, it seems impossible to produce food more perfectly adapted for all our most valuable grain and root crops.

It must also be remembered that it is a cheap and lasting manure, and the supply inexhaustible; and that it is much cheaper and safer to expend our money in the production of this admirable fertilizer, in giving employment to our destitute poor, than in the purchase of guano at unremunerating prices; besides, the chance of getting a spurious and worthless compound, and leaving our unfortunate poor to perish of starvation by the way-side, or of pestilence in the workhouse.

ON THE BREEDING, REARING, AND GENERAL TREATMENT OF SWINE.

SIR—It is admitted by all practical men, that there is nothing of more importance, either to landlord or tenant, than the production of superior swine. All other stock, when bred to perfection, require "climate, soil, and capital," not often within the reach of the tenant-farmer in Ireland; whereas, the higher you breed your pigs, *with judgment*, the more hardy they become, and the more easily fed, both as regards quantity and quality.

The improved Black Berkshire is decidedly the most profitable kind of pig; they attain the greatest weight within a given time, are a hardy pig, well protected with hair, good feeders on all kinds of food, and prolific breeders.

Many prefer white pigs, of which the best I have seen are the Coldshill, or Lord Radnor's breed. The improved Yorkshire are also very fine. I do not consider that either of these kinds can be surpassed, if equalled, as pork pigs—a good trade when there is a market.

To breed pigs well, it is most important that there should be no consanguinity between the male and female, breeding in-and-in being productive of uneven litters, and deformed, unhealthy pigs. This observation may deter many from breeding pigs, thinking that the expense of changing their stock so often would not pay; but the matter is quite simple, breed sows, and buy or exchange a boar every second or third year, for yourself and your tenantry; by this plan, at a small cost proprietors can materially increase the value of the stock on their estates.

As regards form, the nearer the animal approaches to the quadrangle, the better; the ears should stand erect, and close to the head, with a slight curl back towards the points; they are better not too short, with a thin, silky appearance; the nose should be short, the forehead broad and flat, deep chest, long sides, broad ribs, large hams, small bone, standing upright on their toes, with a tight-curved tail, are points to be looked for in a well-bred pig; colour should be pure black, with long straight hair, free from curl; a slight bar of *pure white* across the nose is not objectionable, but rather a characteristic of the *true breed*.

The sow should get the boar at about ten months old, and it is better she should have the first pigs in May or June; it is a genial time for the young mother, and it will bring her in, to have her two litters the next year at the proper times—viz; early in February and early in August.

Some sows will bring five litters in two years, by letting them to the boar on the third day after farrowing, but I do not consider it giving a sow fair play, to make her suckle a litter, and support another in her at the same time.

A sow of the pure Berkshire breed must be fed very moderately whilst in pig, and a run of grass is the best mode of keeping her, letting her have a drink night and morning, of buttermilk or meal and water. When half gone, you may give a little more nutritious food, but beware of over feeding, as one week's mistaken kindness may cause you to lose all your pigs, such is the propensity to inward fat in this breed.

When the sow is about to farrow, which is almost invariably on the 112th day, she will carry straw in her mouth, and her paps will be set, a man should be left to watch her, and to assist, if necessary, in delivering her pigs. He should be provided with a basket lined with a sheep-skin, in which to lay the pigs as they are pigged, as it frequently occurs in protracted farrowing, particularly in winter, that the pigs first littered are perished before the sow is sufficiently recovered to attend to them. The same herd should also have a little new milk to give to any of the pigs he may think require it. A litter getting chilled when young, often take a shake which sticks to them a long time, and leaves them little good. The sow after littering should get a warm drink of gruel with a little ginger on it, and be well watched lest she destroy her pigs

rising or lying down, as she will be careless until she recovers her sickness. Her bed should be short; dry chaff I find the best. Should she have a dead pig, or kill one by accident, it should be removed at once, as she may eat it, and, having once began, may eat them all.

The sow should be fed moderately on good food for the first fortnight; but when the pigs are able to take their share, she must have abundance of milk-giving food. Mangel-wurzel, and pea-meal boiled, I find superior food at this period, and all dairy refuse is acceptable.

When the pigs are three weeks old, there should be an arrangement made that they might leave the sty (by a small door, through which the sow could not follow) to feed on food prepared for them in another apartment; this food should at first be sweet milk, gradually mixed with oat or pea-meal boiled. Pigs treated in this manner are fit to wean at eight weeks old, having attained a shape and character that will never after leave them, if properly taken care of; whereas, if they are neglected during the first eight weeks, neither time nor any quantity or quality of food will produce the same results.

Some may think this an expensive system, but it will be found quite the contrary. The pigs go to market in one-third the time, being at the end of eight weeks a quiet, contented, fat-getting sort, and not as the bad-reared ones, roaring, hungry, narrow-gutted wretches, that will never put up meat until done growing.

It has been the general habit to give nothing to a pig in Ireland that any other animal can eat. This is a great mistake, as there is no animal will pay better for good feeding, particularly whilst young. Quality of food is much more important than quantity, and young pigs should be fed three or four times a day with a little good food, their beds should be dry, and the sties warm. Pigs attended to in this manner will thrive astonishingly; whereas, keeping them in the usual way, letting them run about the yard exposed to all kinds of weather, and fed on trash without nutriment, they get big bellies, lean backs, and ultimately become bad feeders.

The boar should be kept in a quiet sty, if possible out of the hearing of the rest of the pigs, and should not be admitted to serve until after he is a year old.—JOHN QUIN, *Honorary Secretary to the Rathdown Farming Society, Bray, May 16, 1850.*

RULES FOR BUYING HORSES.

[An Essay written for the Farmers' Gazette.]

BY JACOB THOMPSON DUNNE.

I have often been surprised at the timidity and want of judgment which the generality of farmers manifest in purchasing horses. If a farmer wants a horse he seldom depends upon his own knowledge or experience; some groom,

or connoisseur friend of his is often brought many miles, and taken, at a heavy expense, to remote fairs, to select one. Sometimes weeks are spent in such travels before a purchase is made, and even then, what is worse, the *dead lob* often turns out a bad bargain. As the subject is one of great importance, I will embody in this essay what I know, or have gleaned from others, respecting it. Perhaps it may serve some of your readers, more especially as this is the principal season for buying horses.

The purchaser should remark, and cautiously observe many particulars, viz. :—1st. Let him suit himself and his land with a beast fit for his business. 2nd. Let him get a good breed. In this particular he must be guided by a faithful report, his own knowledge, or the characters which distinguish one strain, or the horses of one country from those of another. Arabian, Persian, Turkish, and Tartarian horses are known by their symmetry of form, fleetness, &c.; the Neapolitan, by his hawknose; the Spanish, by his small limbs; but with these *Kochlanies* the farmer has nothing to do, nor with the “high-mettled racer,” or hunter, if he have sense. I shall therefore confine myself to the more useful kinds.

The dray horse was imported into England from Zealand, though the female is styled, “Flanders’ mare,” a title once bestowed on Anne of Cleves, by her royal consort, Henry VIII. These horses, called also *Fen horses*, are powerfully strong, but short-winded; they are generally black, sometimes iron gray, and, often piebald; they require much food, and are too unwieldy for domestic or farming purposes, as Mr. Marshall observes, in his “History of Yorkshire.” The Cleveland bays, the Suffolk Punch, and the Clydesdale horse, are the best in England and Scotland for agricultural business. The Cefal, or Welsh horse, though neither large nor handsome, is swift, good and sure-footed as the mules of the Andes; they were imported by the Romans; their name shows this, for cefal, like the French *cheval*, is derived from *caballus*, the Latin of horse. The ponies of the north of Ireland are said to be of the same strain as the cefals, and have the hardy, enduring Tartar drop in them. The Danes, it is thought, imported the breed whence our working horses are descended. The Galloways, from the south-west of Scotland, are handsome, spirited, sure-footed animals.

3. With regard to colour, I should remark that there are good horses of every colour, yet some colours are reputed better than others, viz. :—The dapple gray is prized for beauty; the black, with glossy hair, for courage; the brown-bay, for service; the liard, and the true mixed roan, for countenance; the sorrel, the entirely black, and the unchangeable iron gray, show a hasty, choleric temper; the bright gray, the fleabitten, and the black, with white marks, are sangui-

nists; the dingy black, the white, the yellow, the dun, Kiteglewed, and the piebald, are phlegmatic; the chesnut, the mouse dun, the red bay, and the blue gray, are melancholy; or according to the old poet—

“If you desire a horse thee long to serve,
Take a brown bay, and him with care preserve;
The gray’s not ill, but he is prized far
That is coalblack, and blazed with a star.
If for thyself or friend thou wilt procure
A horse, let him white liard be, he’ll long endure.”
—See also the late and learned Mr. Doxey’s poem, in the Gazette of September 23, 1848.

4. The pace, which is either trot, amble, rack, gallop, must be looked to according to the intent for which the horse is purchased. The trot is a cross moving of the horses’s limbs, and the nearer he takes feet feet from the ground the opener, even, and shorter is his pace—the feet should move in the same instant; if he takes his limbs slovenly, it shows stumbling or lameness; if he step narrow, it shows interfering falling or uneven, indicates toil and to tread strong shews overreaching. Ambling is contrary to trotting, for both feet at the same side move together when the horse amblse. This motion should be just, smooth, large, and nimble—by large, I mean a long step. Racking is the same motion as ambling, only in a quicker and shorter tread: it is used by post-boys, &c. Galloping is moving the two fore-feet together, and following with the hinder. The horse should take up his fore-feet nimbly, not too high, but stretching them forward and following quickly with the hinder. He should have no swish cuts; the round or high gallop shows strength more than speed. Mind that he leads with the far fore-foot, and that he neither crosses nor claps.

5. The size should be according to the purpose for which you buy, and should answer your land, your stable, and your work.

6. With regard to election, look sharply for external and for signs of internal faults, for few horses are free from either. Place yourself before the animal and take a strict view of his countenance; mind whether it be cheerful or not; let his ears be small, sharp, pricked-up, and loving; if long, well set and carried sprightly, it is also a good sign; but if thick-leaved or lolling, wide-set, and unmoving, they show dullness. The face smart and gay; the forehead high and swelling outward; the feather or star above the eyes, or a small white patch; a white snip on the nose or lip, are also marks of goodness and beauty; but a flat forehead; a fat, cloudy countenance; the star or patch low or set awry: instead of a snip, a bald nose, the face almost depilous, are all bad signs. Large, black, full eyes, without any white appearing when he moves them, are a good omen; but beware of small, red, fiery moving, or pig eyed; if small

specks appear, take care of pearl, or pin and web. Bloody rheums from the eyes show bruises; watery, hurts; dead, dull or hollow eyes show weakness or a dogged disposition.

7. The cheeks and chops feeling lean and thin in the bones when handled, the space between them wide and the throttle or wind-pipe as large as a man can grasp, the void place without kernels or knots, the jaws so large that the neck appears couched within them, are all good signs of health, of head and body, and also of good wind and courage. But if the jaws be fat and thick, the space between them filled with gross substance, the throttle small, they show short-wind and internal foulness; if the void place be full of knots and kernels, it shows glander, or triangles, or at least a bad cold. If the jaws be so straight, that the neck swells above them, it shows short wind; but if the swelling be long and close to the chops, like a whet-stone, beware of *rivers* or some other natural imposthume.

8. If the nostrils be open, dry, and large, the muzzle small, the mouth deep, the lips equally meeting, they show health, wind, and courage; but the nostrils straight show little wind; a gross muzzle shows a dull spirit; a shallow mouth a bad bit carrier; the upper lip not reaching the nether shows old age, or infirmity, and that the beast is entered in the raven's book. If the nose voids clear water, it shows a cold; if foul matter is shows a glanders. Look well at his teeth, and be sure that he is not *bishoped*. At eight years old his teeth will be smooth, no speck appearing, the tusks somewhat yellow. At nine years the foremost teeth will be longer, broader, and yellower than at younger years, and the tusks will be blunt. At ten no holes can be felt in the inside of his upper tusks, they remain until that age; the temples also begin then to be crooked and hollow. At eleven the teeth will be very long, very yellow, black and foul, but still cutting even. At twelve the upper teeth hang over the nether. At thirteen his tusks will be worn close to his chops, if he had been much ridden; otherwise black, foul, and long, like a boar's tusks. The hoofs smooth, moist, hollow, and well-sounding show youth; but rough, seam over seam, crusty, or craggy, show old age. If you feel a joint about the size of a hazel-nut on each side of the tail close to the buttock, he is young; if no such joint be found, he is above ten. The eye full, the *palpebrae* over them full, no wrinkles above his brow or under his eyes, are youthful signs. The skin when pinched up, returning quickly to its place, and being smooth and soft, shows youth. The eyebrows of dark-coloured horses turning gray, or gray hairs under the mane, or white-coloured beasts growing *meannelled* with black or red *meannells* show age. The bars of the mouth great, deep, and hard show age; but being soft, shallow, and tender show youth.

9. Having thus viewed the head, look at his breast and see that it be broad, outswelling, and comely; narrow breasts show weakness, interfering, stumbling, &c., and are unfit for hard toil or violent exercise..

10. Look at his fore-legs and see that they be *rushgrown*, hardened within, sinewed, fleshy, and outswelling, all which show strength; the contrary weakness.

11. See that his knees be of a proper size, clean, sinewy, and close knit. If one is larger than the other, it shows some hurt; if gross, gouty; if scarred or hairbroken, he stumbles.

12. If the legs down to his pasterns be lean, flat, sinewy, and the inner *bough* of the knee without seam or hairbreak, it shows shape and soundness. Hard knots on the inside show *splints*; on the outside, *screws* or *excretions*; scabs under his knees on the inside show the *swish* cut or a bad galloper; scabs above the pasterns on the inside show interfering; scabs generally over the legs show bad keeping or a spice of the *mange*; round, fat, fleshy legs show weakness, dullness, and laziness.

13. The pasterns ought to be short, clear, and well knit; the pastern joints strong and standing upright; if the pasterns be swelled or big, take care of sinew strains or gourdings; if long or bending they show weakness.

14. Hooves to be good ought to be black, smooth, tough, rather long than round: deep, hollow, and full-sounding. White hoofs are tender and carry shoes ill; the brittle are worse. A seamed, round, empty, hollow hoof shows a decayed, inward part, dry wound or founder. If the hair be smooth and close on the crown of the hoof, the flesh fat and even, all is right; but hair staring, the skin scabbed and the flesh rising, expect a *ringbone*, *brownscale*, or *quittor-bone*.

15. Remark the setting on of the head, crest, and mane. Place yourself by his side and see that the head be neither too high nor too low, but in a proper direction; that his neck be small and long at the joining to the head, and growing deeper and deeper to the shoulders, with a high, strong thin mane, long, soft, and somewhat curling; any swelling at the nape of the neck shows *pole-evil*, or the beginning of a *fistula*, a thick bull neck, falling at the withers, and a low, weak, falling crest, show want of strength and mettle; a very hairy mane shows dullness; a very thin one fury; want of name shows the itch, worm in the mane, or mange.

16. Let the chine be broad, even, and straight, the ribs well turned, bending outwardly, the *fillets* upright, strong, and short, and not above a handful between the last rib and knucklebone; let the belly be well let down, yet placed within the ribs; these are all good marks. A narrow chine answers not for the saddle; a bending back shows weakness; flat ribs afford no liberty for the wind; *fillets* hanging, long, or weak,

show a horse bad to go against a hill, or carry a burden. A belly clung up or gaunt shows bad feed or ill health, and unfitness for labour.

17. Let the buttocks be round, full, plump, and even with the body; or, if long, see that it be well raised and spread at the tail part. The pin-buttock, gooserrump, swinerump, dowlet-buttock, &c., are marks of deformity.

18. Let the hind thighs or gaskins be even, full, and swelling, all which show strength; the contrary weakness.

19. The gambrells should consist of skin and bone, veins and sinews, somewhat bending rather than straight, then they are as they ought to be. But if there be chaps or sores on the inward bought, or bending, they show a *sallender*; if swelled, a hurt. The vein full, proud, and soft on the inner part shows a *blood-spavin*; if hard, a *bone spavin*; but if the swelling be behind, before the knuckle, then you may expect a *curb*.

20. If the hinder legs be clean, flat, and sinewy, then they are right; but if fat they will not endure labour; if swelled, the grease is molten in them. If the horse has scabs above the pasterns, he has the *scratches*; if chapped under the pasterns he has the *raus*, but neither are very hurtful.

21. The tail ought to be broad, high, and conched a little inward, screening a large *anus*, which is also a good sign of the horse being strong, and also a good feeder.—*Vide Dictionar. Rust, unde multa supra decripta.*

In conclusion, let him who gets a quiet, sound, good, obedient horse treat him generously and kindly, and he will repay you; for Homer, speaking of horses, justly observes, that—

Of all the prone creation, none display
A friendlier sense of man's superior sway.

For the AGRICULTURAL JOURNAL.

AGRICULTURAL COLLEGES WITH MODEL FARMS.

MR. EDITOR,—In again proposing to your readers the question of Model Farms, I do not intend repeating what they have already read in the columns of your excellent Journal, or elsewhere. This important question has been sufficiently discussed in all its bearings, and, from what we have seen and read, it may be inferred that public opinion is, in general, in its favour. It then only remains to point out the most prompt, practical and economical mode of bringing it into operation.

Here, Mr. Editor, are a few observations on this subject suggested by your publication of the Report of the House of Representatives of the State of New York, on the 1st of March last. The Committee had been formed to take into consideration the Report of Commissioners, named to deliberate on the plan of an Agricultur-

al College, attached to and in connexion with a Model Farm; and to consider that part of the President's message, having reference to the same subject. This Committee reported in substance, that, two-thirds of the population of the state were engaged in Agricultural pursuits,—that, it was the principal source of the wealth of the country—that, a very moderate increase in the produce of the soil throughout the state, would bring an annual return of more than the entire expense of establishing the Institution proposed, even were it to exceed the sum promised—that, while millions are expended on the higher branches of science and literature, this science, the basis of all others, and of more permanent importance, has been left to its own resources, to struggle as best it may, guided by the feeble light of uninitiated experience, without the slightest aid from the government it maintains;—The Committee adds: means have been proposed to promote Agricultural education; the one to attach departments, or branches of Agricultural instructions to some of our literary institutions; the other, to found an Agricultural College on a Model Farm. The Committee has preferred the latter plan, as the more economical, each Model Farm, attached to the present literary establishments would, alone, cost as much or more than a Model Farm attached to an independent Agricultural College. In the former case the same Agricultural professors, library, museum, &c., would be as necessary as in the latter, and, besides, an Agricultural department, so attached, would be but of secondary importance to these Institutions, which would not cease to pursue their principal designs, to the prejudice of Agriculture, which would not receive from the Directors of those institutions the attention commensurate with its high importance— not being the principal object for which such institutions had been founded.

Another and more serious objection—According to the same Report it has been found that the operations of a solely Agricultural College for New York, presents many and greater advantages; for example: the Model Farm better kept, a library, a chemical apparatus, cattle; farming utensils, and all other appendages of a farm kept on a large scale, such are the advantages of a College uniquely Agricultural.

These reasons, Mr. Editor, are cogent and convincing, and, to me appear incontrovertible. Literary Institutions and Agricultural Institutions are too different—if not opposite—in their nature, ever to march in harmony if attached to one another. These considerations are as applicable to Canada as to the United States. It will not do to attach Model Farms to any of our literary Institutions.

How then it may be observed, can a new College be founded in our actual circumstances? who will undertake the enormous expence of erecting and endowing such an establishment.

Our literary institutions, at least those of recent date, have so precarious an existence, that such observations are just and well founded,—But let us see.—

To obviate the greater part of the difficulties, above all, to secure economy, there exist abundant means to facilitate this undertaking. Suppose one of our literary Institutions condescended to accord its patronage (not its purse) to an Agricultural College,—founded in its immediate vicinity, suppose furthermore, that it furnished the land necessary for a Model Farm, say 100 acres, in a suitable locality; what then would be wanting, but to erect an appropriate edifice and procure Professors? which, no doubt, would be a great deal. But again to hypotheses, suppose that in some part of Europe—the north of France for instance, where the climate sufficiently assimilates our own, some intelligent members of a Religious Fraternity were found, tried, proved and perfected in the theory and practice of Agricultural Education; suppose they consented to undertake the guidance of similar studies in Canada provided a moderate sum, barely sufficient to cover their travelling expenses, with an annual pittance of about £30 a year were allowed them. All these “suppositions” are not the delusive fancies of a dream, but tangible facts, possible, practicable and attainable. And, now, I shall calculate the expense of such an establishment.

A wooden two-story house, 100 feet long	£800 0 0
Indispensable furniture,.....	100 0 0
Horses and other animals,.....	50 0 0
Farming utensils, seeds, &c.,	50 0 0
Library, Chemical instruments and museum merely to commence with,	150 0 0
Erection of necessary appendages, such as:	
1st. A workshop for the students to practise in under the superintendence of two foremen, in fabricating farming utensils in wood and iron,.....	150 0 0
2nd. Out-offices, stables &c.,.....	150 0 0
Charge of bringing two Professors from Europe,.....	80 0 0

Amount necessary to set the establishment agoing,..... £1530 0 0

In order to show how this establishment might be sustained, I thus calculate its probable receipts and expenditure:—

Receipts.

100 Extern pupils, (no boarders admitted), £5,	500 0 0
Annual allocation,.....	150 0 0

Amount of Receipts.....£650 0 0

Expenditure.

2 Professors such as above mentioned,.....	£60 0 0
2 Tradesmen, to superintend the workshops	70 0 0
4 Servants at £10 each,.....	40 0 0
Fuel, &c.,.....	35 0 0

Augmentation of the library and museum, and annual purchase of seeds and live stock,.....	150 0 0
Repairs and incidental expenses,	150 0 0
Probable deficit in receipts,.....	145 0 0
	£650 0 0

I conclude with an exposition of the principles on which I conceive this establishment ought to be conducted.

1st. To adopt the most productive system of Agriculture, the least expensive, in money and labor as well as the most applicable to a country where capital—like property—is possessed by all.

2nd. To receive but Externs, as parents could more conveniently support their children in the vicinity of the College, by the produce of their farms, than by paying the most moderate charge in cash.

3d. The course of studies to continue but two years for those who on entering know how to read and write, Students to be taught to write French correctly, with a little Arithmetic and Agricultural Chemistry.

4th. The Student's time to be divided between study and manual labour, either on the Farm or in the workshops,—according to the season.

5th. The College to be under the inspection of the literary institution to which it would be, as it were, united, in pursuing its legitimate duties. How many such Colleges would suffice for Lower Canada? one, only to commence with, whose practical utility would facilitate the erection of others. I may be asked:—where find money sufficient for so great an enterprise? My answer is that of the Committee of the Legislature of New York. “The College being for the benefit of the State should be founded by the State.” Such Mr. Editor, is the plan I propose, with more time and reflection I could perhaps, reply more suitably to your kind request, but in the short space of a few hours, I find it impossible to be infallibly accurate. However, such as it is, I pray you accept it with my hearty concurrence. Others may handle the subject more ably; I wish they may, for nothing would delight me more than to see it sustained by the ablest talent in the land.

X. Y. Z.

June 4th 1850.

SCHOOL OF AGRICULTURE, QUEEN'S COLLEGE, BELFAST.

The courses of instruction in the Queen's College, Belfast, will commence for the next session in the month of October, and continue during two terms of the session, about six months. At the entrance examinations four scholarships will be granted to the most distinguished candidates—viz, two scholarships to students who have already attended the agricultural classes in the

Queen's Colleges, and two junior scholarships to students about to commence their agricultural education. The candidates for the senior scholarships will be examined on the subjects treated of in the lectures of the present session—viz., on the elements of chemistry, agricultural mechanics, the elements of zoology and botany, the theory of manures, and the feeding of farm animals. Students who present themselves for the first time are subjected to an examination (matriculation examination) in English grammar and the elements of arithmetic. The object of this preliminary examination is to ascertain that the young men who may wish to attend the lectures have received a sufficient amount of education to enable them to understand the instructions of the Professors. The same plan is adopted in the great agricultural colleges of the Continent; non-matriculated or private students are, of course, permitted to attend any of the lectures without being required to submit to the entrance examinations. At the conclusion of the courses prizes are distributed to the most deserving students. The agricultural scholarships of the first year are granted to students who exhibit the greatest proficiency in the following subjects:—English Grammar and Composition; the first four rules of Arithmetic; Vulgar and Decimal Fractions; Involvement and Evolution; Proportion and Simple Interest; Mensuration; Book-keeping; Outlines of Modern Geography. The method followed in conducting the examinations is to give printed papers containing the questions to which the candidates are required to write answers. The fees for the agricultural pupils have been fixed at a low rate, so that those who may desire to obtain a first-class education in all the branches of knowledge which relate to agriculture, may secure it at a very small expense. The agricultural department in the Queen's College at Belfast, has been intrusted to the following professors:—

Theory and Practice of Agriculture, John F. Hodges, M. D. Chemist to Chemico-Agricultural Society of Ulster, late Professor Chemistry in the Royal Belfast Institution.

Elements of Chemistry, Thomas Andrews, M. D., Vice President of the College.

Agricultural Mechanics, John Stevelly, LL.D., late Professor of Natural Philosophy, Royal Belfast Institution.

Natural History of Farm Animals and Agricultural Botany, George Dickie, M.D., late Professor of Natural History, at Aberdeen.

Mineralogy and Geology, F. M'Coy, Esq., Cambridge.

Agricultural Engineering, John Godwin, C.E., Engineer, &c., to the Ulster Railway.

It is also in contemplation to establish a class for land-agents, &c., under the direction of the Professor of Agriculture and the Professor of Political Economy, W. N. Hancock, Esq., LL.D., late Whately Professor of Political Economy in

Trinity College, Dublin. The matriculation and class fees in the school of Agriculture we may state are, for the first year, £7 10s. for students, and £4 10s. for scholars. Students who have attended all the lectures prescribed in the course, and submitted to the examinations, will receive a diploma at the termination of their studies. We look forward with confidence to the most beneficial results from the arrangements which have been adopted, and anticipate that the Queen's Colleges will do much to remove from our country the reproach which travellers have, with too much foundation, cast upon our land-agents and farmers, of possessing less Agricultural knowledge than any similar class in Europe. We do not, indeed, pretend that the instructions communicated in the Queen's Colleges can be regarded as sufficient, without that practical acquaintance with the details of farming operations, which can only be properly acquired in the farm. The sound farmer should understand both the theory and practice of his art; but we are justified in asserting that he will be the most successful and economical cultivator, and the most capable of directing the practice of his workmen, who has made himself acquainted with the principles of his profession.—*The Journal of the Chemico-Agricultural Society of Ulster.*

PORTABLE GARDEN FORCE-PUMP AND SYRINGING MACHINE.—“HORTENSIA,” Kells, asks our opinion of Mr. Fraser's syringing machine, noticed in the report of the show of the Royal Horticultural Society of Ireland in the *Gazette* of the 27th of April.—We have repeatedly examined and tried the light garden force-pump, syringing and watering machine at Mr. Fraser's elegant establishment in Mary-Street, since it was exhibited at the late flower show of the Royal Horticultural Society of Ireland. It is the most elegant, and the best adapted watering and syringing machine we have yet seen. By placing it in a water-pot of even the smallest size, the most delicate lady can throw the water in a jet upwards of twenty-five feet high, when it breaks out into a copious shower, or drive it to a distance of more than thirty feet, watering the whole area of that circumference with a soft dewy shower. It is a most admirable implement for washing the most delicate plants, as by the pressure of the thumb on a spring, a soft shower can be let fall upon, or be driven against any part of it, at pleasure. The implement is scarcely larger or heavier than a good walkingstick, and from the simplicity and accuracy of the fittings is not liable to get out of order.

He that does good for good's sake seeks neither praise nor reward, though sure of both at last.

Agricultural Journal

AND

TRANSACTIONS

OF THE

LOWER CANADA AGRICULTURAL SOCIETY.

MONTREAL, JULY, 1850.

We are much rejoiced to find that the Legislative Assembly named a Committee to enquire into the state of Agriculture of Lower Canada. There is, therefore, every probability, that some effectual measures will result from the action of the Legislature, upon the report of this Committee. No doubt can exist as to the necessity of great improvement in the general system of Agriculture practised in Lower Canada, and the question is, how this system can be improved? It may be thought by many that it is not necessary for the Legislature to interfere or take any trouble in the matter. We find, however, in the old countries of Europe, that the Governments and Legislatures do interfere and provide for the improvement of Agriculture, and that many of them have a Minister of Agriculture to attend especially to this interest alone. We may be answered that in England it is not so, and that her Agriculture is more advanced in improvement, notwithstanding, than in any other part of the world. We reply to this, that England is differently circumstanced from other any country, having a wealthy, numerous, and enlightened proprietary, whose interest it is, to do all that is possible for the improvement of Agriculture, and who have, done and are doing so constantly. We have no proprietary here who are equally interested to promote Agricultural improvement, and unless our Legislature supplies the place to us, of what English proprietors furnish to British Agriculture, we cannot expect to make much progress in Agricultural improvement; the matter is quite plain.

If the improvement of husbandry is desirable in Lower Canada, the measures that are necessary for its improvement must be introduced, and by whom are they to be introduced, if not by Legislative means. It is of some importance whither a country should annually create a value of five millions of pounds currency, or whether this annual value should be ten million pounds currency? We may be so partial to the business we have been brought up to, that it has more importance in our estimation, than it would have in the estimation of any other party, but we certainly cannot perceive how it is possible for our Legislature to do more good for our country, than by ascertaining the actual condition of our Agriculture, and then provide the means that would appear necessary to secure its improvement and prosperity. There cannot be any mistake as to the unmixed good this would produce to the Canadian people. This would be securing the means of prosperity to trade, and commerce, and to every other business, and profession. No other subject that can occupy the Legislature, can have the hundredth part of the importance to the people that this has.

We hope we shall be excused for urging this subject so decidedly, but we do so from a sincere desire to see the country prosperous, and we do not know of any other means under Heaven of making her securely and permanently prosperous, but from her own natural resources. If there is any other means, let them be proposed. We do not say that Agriculture alone is to do every thing for us, but we do say, that it is the products of Agriculture that must give healthful action to every other employment in Canada. As we before observed, there cannot be any mistake in doing all we can to promote the improvement and prosperity of Agriculture. It is quite possible to commit mistakes on other subjects, but in this alone it is not possible for us to go wrong. We may be censured for taking this

liberty, but we should not be doing our duty in the position we occupy, if we were not plainly to urge the importance of the cause we advocate ; and then we cannot accuse ourselves hereafter of neglecting this interest at this critical moment. It would only be what we might expect, that all parties who desire to see our Agriculture improving, and agriculturists in a prosperous condition—would give all the information in their power to the Committee of Agriculture, to enable them to come to just conclusion as to the present state of Agriculture, and the best means to adopt for its improvement. We have no doubt, that a considerable difference of opinion will exist among farmers as to the best means that could be adopted for the improvement of Agriculture where most requiring it. Of one thing, however, we are certain, that the means to be effectual, must be very different from any hitherto adopted in Canada, and any party who would give a contrary opinion, we should be inclined to doubt their judgment or sincerity. We have had a long experience of what has been done, and we can perceive to what little purpose, for the improvement of Agriculture, where improvement is most decidedly wanting. If the Legislature should apply any of the Public Revenue to the encouragement of agricultural improvement ; we humbly conceive it should be employed to the best advantage to produce that improvement, generally throughout the country. The most indigent, and remote farmer in the country should be able to perceive the good effects of the encouragement granted by the Legislature. He should feel that the application of this grant was beneficial to him, however poor, and insulated his situation. This is the mode we would wish to see adopted in the expenditure of public money for the encouragement of agricultural improvement, and if the expenditure is not for the advantage of the poorest farmer in the country as well as for the rich,

we confess we do not perceive the expediency of making the grant. Parties may find objection to this proposition, but we are persuaded of its justice, and expediency also. It is not to the most skilful and most wealthy of our farmers *alone*, that Legislative grants for the improvement of our Agriculture should be paid. Let the poor unskilful farmer derive some benefit from it also ; by instructing and encouraging him to adopt a better system of husbandry. Farming societies who subscribe their own funds may adopt such regulations as they think proper for distributing them ; but it is not so where public money is granted to produce improvement rather than reward improvement. If good husbandry is not able to reward itself, we should not encourage its introduction. The whole sum of our argument is ; that the poorest, and most unskilful farmer in Lower Canada shall participate in the benefit of Legislative grants for the improvement of Agriculture, and any measures or regulations that may be adopted should securely provide for this.

We frequently copy articles from English periodicals descriptive of what is known in Britain as “High Farming.” We do not propose that this “High Farming” should be introduced generally in Canada, but in reading these descriptions, there are many useful hints we might notice, and practise with advantage. Any farmer who has got sufficient education to enable him to read, can not read too much of what is published relating to Agriculture, unless he is pre-determined never to alter or change in any particular, from the system practised by his fathers. He must be a very extraordinary farmer indeed, who would read the Agricultural publications of the present day without advantage to himself. The expediency of introducing the high farming of Mr. Machi, Mr. Huxtable, and others, into this country, might be very questionable, but

there cannot be any question, that the example of these gentlemen, and what has been published by them on Agriculture, has produced immense benefit, and might be read with advantage by every farmer however skilful or unskilful in his business. The nearer that every Canadian farmer can approach to a perfect system of husbandry the better it will be for him. If he is unable to thorough drain his land, he should at all events, drain it sufficiently, or as well as his means will admit, by open drains, as it is useless for him to cultivate land that is not sufficiently drained. If he cannot manure his land as well as they do in "High Farming" he should only cultivate the lands he can manure, or keep in a state of fertility by Summer fallowing. He may rest assured he will not find it profitable to sow more land than is in a state to produce fair average crops. It will be better for him to have ten acres of good crop, than twenty acres of bad crop—and the land will always be gaining fertility while allowed to remain in a state of repose. Again, as regards animals, however desirable and necessary it might be to have a considerable number, he should not keep more than he can maintain properly, in Summer, and Winter. Let him have good pasture and sufficient meadow, and then keep a stock of animals in proportion. We find no fault or offer no objection to any farmer having a large sized stock of neat cattle, if he fancies and prefers them—although we would prefer, *under any circumstances*, moderate, or middle sized cattle to very large, yet no party can be condemned for keeping large cattle, if they are properly maintained in a constant state of progressive improvement. We only dispute the expediency of introducing large cattle, where there is seldom sufficient keep for small. As to pretend that large cattle are as easy to maintain as small, we decidedly say we are convinced of the contrary. The only mode of ascertaining the

fact, is by having two equal quantities of land, of the same quality, and an equal number of large cattle on the one, as of small cattle on the other, during the Summer, or while they can be kept on grass. Grazing large cattle and small together on the same pasture can never be a fair experiment. In Winter, also, the large, and small should be kept completely separated, both in the yards, and the stables; and the quantity of food regularly weighed or measured to each. This is the mode of making fair experiments, and we have no confidence in any opinions formed of the comparative value of large and small cattle, that are not grounded upon experiments made, in the manner we have described. In Canadian husbandry, including the keeping of stock, that which produces the most over the expenditure for its production, should have the preference. If slovenly farming and ill fed stock would produce more profit, than careful, and judicious farming, and well kept stock, we should not recommend the latter system. We do however recommend it most strongly, and any of our readers who may doubt its profitableness should make a fair experiment of both systems, so far as his means will admit. We should, indeed, be exceedingly sorry, to advise our brother farmers to do anything that would be likely to prove injurious to them, and we are always most cautious in recommending any new plans to them that would involve them in expenses that might not be refunded to them. We wish to see an improved system of husbandry *gradually* introduced, and that every farmer who commences it, may prove the utility and profit of the system as he proceeds to make changes. We do not expect that any farmer will adopt our recommendations in every thing at once without first considering them, and then proving them by fair experiment. In making experiments however, we hope they shall be made fairly, and fully, not half doing the work, and leaving

the blame of failure upon us. For instance, in that of summer-fallowing land, we expect it to be executed in every part of the process as we have given directions for it in former numbers of this Journal. The first ploughing should be given to land intended for Summer fallow, in the previous fall, and the land should be well drained. In the Spring it should be again ploughed before it is allowed to be covered with grass and weeds, and every subsequent ploughing and harrowing be executed when required to keep the soil clean and free from grass and weeds taking root in it. And if they should abound, they should be gathered and burned, or collected to the compost heap. Summer fallow, executed in this manner, we shall answer for it, will pay the farmer well, but if not so executed, we should not consider it as Summer fallowing. It is the same case in every improvement we propose, they will have to be executed fully and properly in every respect. Bad ploughing, insufficient draining, bad harrowing, not sowing at the proper period, not applying manure properly, or in sufficient quantity, not using clean seed, not observing any regular rotation, all these are inconsistent with any good or profitable system of husbandry, and are at variance with any improvements we have recommended in Agriculture. We know and have seen sufficient of this imperfect cultivation, and the results from it, and improved systems of husbandry condemned, because these imperfect attempts at improvement did not succeed, and who, that knows anything of good husbandry, could expect that they would. Our limited capital, and other circumstances, will not warrant our introducing "High Farming" but an improvement in our system of husbandry is actually necessary to our well-being, to be generally introduced, in order to give Agriculture any chance of prospering.

We have for many years, remarked with regret, the extraordinary waste of manure

in Montreal, while the lands in the country, at a short distance from the City, require to be manured. We have seen excellent manure placed upon the ice of the St. Lawrence in Winter, to be carried off by the river in Spring. We have also seen valuable manure carted to hollow places, and to fill up roads in town, which, putting the loss of the manure out of the question, we think a very objectionable mode of disposing of the filth of the City. There must be some cause, that manure, which is so essential to the farmers, should be applied in this way, instead of to the production of crops. The want of capital may prevent many farmers from carting this manure in the Spring, but we cannot admit that the city authorities should allow valuable manure to be applied in the manner we have stated. The farmers are so much hurried in the Spring, that they may not be able to cart away the manure, but as this is the time that yards, &c., have to be cleansed of manure and filth, it is carted by order of the city authorities from one place, to be thrown down in another, within the city, to ferment and rot. If all the manure that would be thus collected was put into a suitable situation, the farmers might be able to cart it away after the hurry of Spring. It is certainly a great loss to the public the large quantity of valuable manure wasted in Montreal annually, and we do not see any necessity that it should be so. It would be a public benefit if the manure was placed by the city, in situations where the farmers could come and cart it at their leisure. The time will come when this manure will be more regarded by Agriculturists, and come into use. At all events, the manure, we conceive, should not be applied as it is at present, thrown into the river, or made into roads, pathways, or filling up low grounds in the city.

Grief ennobles. He who has not suffered can never have thought or felt.

AGRICULTURAL REPORT FOR JUNE.

We had rain for the first three days of June, but the weather then became fair, warm, and favourable for completing the sowing and planting. We observed, however, that much of the ploughed lands got foul with grass and weeds before they could be sown, and we fear this will have a very injurious effect upon the crops. Soil intended for root crops also, although requiring to be ploughed again, cannot be so managed as to prevent the grass and weeds vegetating immediately after the seed is sown or planted. The only possible way to prevent this would be, to gather all the weeds and grass, and remove them, but there was not time to do this, and we have seen the weeds and grass commence growing in land sown, in two or three days after the sowing was finished. The prevention of this, in keeping down the weeds and grass will give a great deal of trouble this year, and cannot be done effectually. We have not been through much of the country this Spring, and therefore, we cannot speak of what we have seen, but we understand that it was not possible to sow on clay lands until far advanced in May, and in some cases, not even then. We may of course, form some idea of lands we have not seen, by the state of other soils of the same quality that we have seen, and there can be little doubt that the sowing is generally very late in Lower Canada, where there is such a large proportion of the lands, very level, the soil clay, and not too well drained. The success of the crops must consequently depend, altogether, on the favourable nature of the season from this until harvest time : where seed has been sown in time, and the soil in a good state, the appearance of the young crop is very promising indeed, both healthy and luxuriant. The greatest evil of a tardy Spring, is that farmers have to do their work imperfectly ; there is too great a hurry in striving to get the seed in, in any way. This is particularly the case this Spring ; we suppose it will

have required the whole month of June to finish the sowing and planting, if it is completed then. It would be well for farmers to do all in their power to check the growth of weeds in the crops, as we are sure they will be very prevalent. The month of June has been on the whole favourable to vegetation in the neighbourhood of Montreal. It has not been too wet nor excessively dry, and the meadows generally look well, unless where the lands were poor or ill-drained. It is exceedingly difficult in such a Spring as this, to get strong clay soils, that are not well drained, in a good tilth and fair working order. It becomes so excessively hard the moment it is fit to plough or harrow, that it is almost impossible to work it properly. If, for green crops, it requires several ploughings, rollings, and harrowings to pulverize it, and a common roller has very little effect. A clod crusher, such as they use in England, that is furnished with short iron teeth, is the only implement that is suitable to break, as well as crush the hard lumps of soil. Without this, however frequently ploughed and harrowed, large lumps will remain unbroken. We are very deficient here in suitable implements for Agricultural operations, compared with the ample assortment of these things to be found upon an English farm. They have implements and tools suitable for every purpose required and of the best construction, and quality. This makes the business of farming much more easy and certain. Summer fallows, where in progress of working, should receive every attention. The whole benefit of the process, depends upon its proper execution. If weeds and grass overrun the soil, the benefit of ploughing will not be much. In the intervals between the ploughings and harrowings, it may be proper to allow seeds of weeds to vegetate, in order that when they have sprouted, their seed, may be effectually destroyed, by the next ploughing and harrowing, exposing them to be dried up. It is an excellent plan to burn any weeds or

grass that can be collected upon the soil, and at the same time some of the soil might be charred with the weeds when burning, and it would answer as manure. Summer fallow, when executed as it should be, is a very good means of improving land, when, perhaps, a farmer has no other means in his power. Turnips may be sown up to the 10th or 15th July. The great point is, to have the land well manured and moist, when the seed is sown. Ashes is the best manure for turnips, as, if abundant, the fly seldom destroys the crop. Steeping the seed in soft water for at least twelve hours before it is sown, and then steeping it the most offensive smelling train oil for a like period and drying it with sulphur for sowing, will have a great tendency to save it from the fly, provided the soil is moist, or made so, when sowing. If the seed vegetates rapidly, it will retain its offensive smell, until it gets into the rough leaf, and the fly will not destroy it then, although it may injure it in some degree. It is not too late to sow buck-wheat even now, if not for a matured crop, to make fodder for cattle, as we suggested in a former number. Oats might also be sown to save and cure as oat-hay. Ploughing in green crop as manure should not be neglected where possible. Rape-seed is considered the best to sow for a crop to plough down in this way. Seed does not cost much, and as rape is an oil plant, it is considered best as green manure. In Summer fallows, that have received the necessary ploughings up to this time, it would be very well to sow rape, to plough down in the fall as manure. It should be sown sufficiently thick that it would keep down all weeds. It is a plant of rapid growth. There may be the same necessity for preparing the seed, as for turnips, to prevent insects injuring it, but not having sown it in Canada, we are not certain of this. It is, at all events, no harm to prepare it so, as the expense is not great. The hay harvest, will have commenced

ed, and be nearly finished in July. When the timothy will have come into blossom, the sooner it is cut and housed, the better will be the quality of the hay for every purpose. In fine weather, we have seldom broken the swarths after the mowers, unless the crop is very heavy, and much mixed with clover, then it is necessary to spread them out to dry. When nearly pure timothy, we have generally put into cocks from the swarth, all that has been cut by the mowers, up to dinner time, with that cut the day previous from the dinner time, always provided the weather is fine. What is cut in the morning before the dew is off, may require to be turned in the swarth, before it is put into cocks. It may often be necessary to turn what was mowed the previous afternoon before it is cocked, but we have done this without breaking out the swarth, but merely turning them over. In making cocks, each person takes three swarths and makes the cocks in regular rows, on the ridges, not in the furrow. If the crop is heavy, two swarths may be sufficient. The hay should be all shaken up in making the cocks, and the latter well formed. In fine drying weather, when the timothy is not much mixed with clover or other grasses, we have frequently carted the hay from the small cocks, without spreading it out. If further drying is necessary we have spread every two or three rows of cocks together, raking the intervals, and giving the hay one or more turnings, if necessary, before it is carted to the stack or barn. It is very seldom in our climate, that hay requires to be more than once, spread out of the cocks it is first made into. Hay requires to be made dry before it is stored, but in doing this the less it is exposed to sun, dew, or rain the better. Heavy dew is as injurious to hay, when once partly dry, as a shower of rain would be. We should prefer having mowers idle, and pay them for it, than to cut down meadows in rain. Clover is much more difficult

to cure than timothy, it has so much sap, when cut at the proper time. The farmer should endeavour to cure and save it, with as much of this sap as possible. The blossom should be saved upon it, as it is a valuable part of the plant. When cut it should be turned in the swarths without breaking them, and it may be turned over a second and third time if required to dry it. It should be preserved from wet if possible by making it into well formed cocks, as soon as it is fit. If considerably dry when put into cocks, it may remain so for two or three days, and then be remade into cocks shaking it well. It is possible to save clover perfectly without again spreading it out, by frequently remaking the cocks. It should be prevented from becoming musty, when there is any tendency to this, it should be spread out. Clover requires the most careful attention in the process of curing. In moist seasons, this is very difficult. If not sufficiently dry when storing, it is a good plan to mix layers of good dry straw with it, adding some salt. Cattle will eat both straw and clover during the winter, but whether or not, the dry straw will preserve the clover from injury and the straw will not be lost. Clover should be cut before the blossom withers, and the blossom and leaves should be preserved upon it, if possible, as they are the best part of the plant for provender. There is no better hay than timothy cut in time and well saved, nor do we think there is any so good. Clover is also highly estimated, but its value greatly depends upon the time it is cut, and the manner it is cured. Other varieties of hay, produced on natural meadows, require to be managed differently from timothy and clover, they need not be cut so early in the season, and they require more drying and seasoning before they are stored. Salt should be mixed with them in storing. Those natural grasses, however, should not be allowed to remain too long uncured. The seasons are not so suitable for dry-

ing them, nor is the quality of the hay so good when cut late. A dry and sunny hay harvest, is of great benefit to the farmer, to the purchaser of hay, and to the animals which consume it as food. No product of the farm suffers more by wet weather than hay. There is another part of hay making, we see often neglected in Canada, that is the raking. When hay is not carefully gathered, there is a considerable portion of it remains for the rake to gather, and if the raking is not done before the hay is too much exposed and withered, it is scarcely worth the trouble of gathering. Nothing appears more slovenly than hay badly gathered, and not raked immediately. Every crop we grow should be gathered, and the farmer who thinks it will not pay for the trouble, or who is too much hurried to have the work done properly, should only cultivate so much crop as he could manage carefully and properly. We conceive it to be little less than criminal to allow portions of our crops to go to waste after they are produced, for want of careful gathering.

We have seen potatoes that have been planted in the month of June, ploughed up again, and re-planted—the first seed having rotted. In one particular instance the land did not appear too wet, when first planted, because it was ploughed, harrowed, and manured, immediately before it was planted first. We do not know whether the rotting of seed has prevailed to any considerable extent, but we consider it very unsafe to plant potatoes that are cut, when the weather is very warm, as it has been in June. If they were not cut, they would not be so liable to rot. Early planting of potatoes is much preferable to planting late; and this year, where they were planted early on dry soil, we have never seen them look better. We fear that late sowing of grain, also, will not succeed very well, unless we have rain occasionally. It is impossible that the young plants can advance very rapidly in the

dry hard soil, without frequent showers. Indeed, we have seen meadows on very dry soil becoming considerably affected by the great heat, about the 22nd June, and the grass quite parched. We have never seen the soil in a more hard and cloddy state, than in the month of June, where ploughed this Spring. We fear that grass seeds, sown in June, will not succeed well, unless where the soil has been well crushed and broken down. The grass seed sown early has succeeded very well; and in our climate, it is very rarely that when sown after the middle of May, it succeeds satisfactorily. Great heat and drought are not favorable to the early growth of grass seeds. The pastures have continued very good up to this time, but continued heat and drought will very soon have an injurious effect upon those that are exposed, and without a thick covering of grass. The great advantage of thickly covered pastures is, that heat and drought do not affect them so quickly as when they are bare and have not been regularly seeded down. Our pastures here generally do not deserve the name. They are merely wastes, that cattle may exist upon, if they can; but they are not calculated to produce milk, butter, or cheese, or fat animals. We do not say that all of our pastures are such as we describe, but we regret that a large proportion of them are so. We have constantly urged, that good pastures would be as profitable to farmers as any state their lands could be in, because they would not only give a good return in that state, but they were always ready to be converted to any purpose thought expedient, and could yield a crop without any manure. This would be of great consequence to a farmer, that he had land ready to be taken up at any time, that would be sure to yield a good crop of any description for which the quality of the soil was adapted. We hope that farmers who have many milch cows, will endeavour to make butter and cheese of the best quality, and put up the butter in kegs that will be fit for exportation. The butter should be of

uniform colour, quality, and saltiness, packed closely into the keg, without the slightest interval between the layers of butter, and the kegs headed up carefully. The butter, put up properly, will keep for a year, as good as when put up. The grand point is, to leave no milk or water in the butter, and that it shall be good when put up, and if it is, it will keep so. The milk is generally of much the same quality when taken from the cows. It is in the farmer's management of it subsequently, that good or bad butter and cheese is produced from it. From the moment it is milked, one party adopts one plan of management, and the other party another, and, of course, we need not be surprised at the different qualities of butter and cheese. One farmer's butter is fit for the table of our Queen, and the other only fit to grease carts or machinery;—the cheese of one is fit for any man's table, and the cheese of the other only fit to make wheels for wheelbarrows. It is the same case in every branch of husbandry. Skill, and judicious management, will produce favourable results, generally, while the want of them will produce the contrary results. There is no part of the farmer's business requires more of practical skill, and the most careful management to be constantly exercised, than in the dairy, and in making cheese and butter. Cheese from the same dairy is often of such various qualities, that we could scarcely think it possible to be made from the same quality of milk, and by the same hand. Hurry and carelessness are often the cause of producing bad butter and cheese; unsuitable dairies are another cause. The consequence, however, is a serious one, as the produce of a well-managed and constantly well-regulated dairy, would, we have no doubt, be worth double the amount of the produce of an ill-managed and ill-regulated dairy.

We had a small sample of white wheat given to us at Syracuse last September, and although we were not able to sow it previous to the 20th of September, it was in ear the 20th

of June, and we hope will escape the fly. We mention this to show, that if fall wheat was sown in time, there would be every probability of its succeeding well. We should prefer sowing it before the end of August, in drills, if possible, or, at all events, with more covering than the harrow would give it. We believe a slight covering of small branches of brushwood would be very beneficial, and not very expensive. It would be better than straw, as straw would lie too close, and might perhaps cause the decay of the young wheat plants. The brush might be readily gathered off the land in Spring. We would strongly recommend some experiments to be made this year. Summer fallows would be the best preparation, and they might be ready quite time enough.

The showers we had on the 23rd and 26th of June were of immense benefit to crops in the neighbourhood of Montreal and as far as they extended. With such showers occasionally, the crops would make rapid progress, and amply reward the farmers' skill and industry in proportion as both have been exercised. Weeds should be kept down, at almost any cost. Where wild mustard is allowed to come to maturity, and shed its seed it is a great injury. We have seen fields laid down for meadow, where this wild mustard seed has grown up, and completely hid the grass with its yellow blossom. The wild mustard will of course be cut down with whatever hay there may be, and thus the seed will be taken into the barn, and again scattered over fields, where, perhaps, it was not to be seen before, and hence perpetuate this pest to the farmers. The great ox-eye daisy is another pest that is prevailing very much, and cannot, we believe, be kept down, unless by tillage. Those two weeds are the worst we know of in Canada not excepting the thistle, as the latter may be kept under by care and attention.

June 27th, 1850.

We are glad to invite attention to an advertisement in this number of the "Stump

Extirpator" a most useful machine of Canadian manufacture, and invention. We have not seen it at work, but we have been told that it operates well and successfully, and we have no doubt of it. An implement of this description would be a great assistance in clearing land, and the price is so moderate, that almost every farmer having woodland to clear, or any settler, might purchase one. But in fact one machine might be sufficient for several farmers or settlers. We have seen the machine, but not in operation. It must be very powerful in proportion to its extreme simplicity, and is infinitely preferable, we should think, to these great cumbersome machines we have seen in the United States, and is invented by a Canadian. Its simplicity and cheapness are highly creditable to the inventor and manufacturer, and he should find every encouragement from all friends to native manufactures and industry. There is another manufacture that we are glad to see in progress, at Montreal, (although we are against the use of tobacco) for making tobacco pipes. The material appears to be of the best and most suitable quality, and found up on the spot. Indeed we should think this clay, of which the pipes are made, might be employed to much more useful, and profitable purposes in the manufacture of delft for our own use. We wish all possible success to native manufacturers who will make good articles, and sell them at a fair price, but we do not see any particular reason to encourage native manufactures, if they are not as good and as cheap as we can import.

"ASSOCIATIONS OF AGRICULTURAL CREDIT."

This is a subject we are not disposed to give up advocating, until some action is taken in the matter. We have not lightly taken up the subject, without due consideration, nor shall we cease to recommend it, until it is proved to our satisfaction, that the system

would be unsuitable for us, and injurious to the country. So long as this remains unproved, we shall assume that we are right, and that we are deprived of advantages that ought to be granted to Agriculture, to give it a fair chance of success. Who can doubt the immense amount of capital that really belongs to Agriculturists, in lands—houses—stock, &c., &c. Their value is, undoubtedly, depreciated, because, if a farmer gets into difficulty, however trifling, he has no means of relief, but is utterly ruined, by law expenses, and is soon sold out, at less than, perhaps, a fourth of what his property and goods are worth—if disposed of by himself.

Hence Agriculturists' property is greatly depreciated in the market, when brought to sale, because non-Agriculturists are generally the purchasers on speculation. From all these causes, Agriculturists have no great chance of advancing in improvement and prosperity, without increased capital, or the means of obtaining it on their own security on reasonable, and equitable terms. It is absurd to profess our opinions of the vast importance of Agriculture, &c, &c., if every other interest is to receive more care and attention than Agriculture. The most rational way we can show our estimation of the vast importance of Agriculture, is by giving it all the attention and encouragement in our power, to secure its prosperous condition. Parties engaged in commerce and trade are able to manage to obtain accommodation when they require it, in proportion to the extent of their business. Farmers cannot do anything of the kind. The Banking accommodation suitable for parties engaged in commerce and trade would not be suitable for Agriculturists. The system of "Cash Credits," adopted so successfully in Scotland, or the "Associations of Agricultural Credit," (which are still better) are the only means of accommodation suitable for farmers. We do not propose this plan as a scheme of

our own, but we recommend it as one that has been tried in other countries, with the most advantageous results. Under our present circumstances how does it fare with Agriculturists? If property belonging to them has to be sold, it very rarely happens that an Agriculturist is able to purchase. It is bought by other parties, generally on speculation to sell again. We would be anxious to see farmers in a position, that if involved by any chance in difficulties that might be overcome, they would be able to obtain relief, without being utterly ruined, and their property sacrificed. We do not ask or wish any unfair advantage for them, we only are anxious that there should be means in their power for their relief, so far as they could offer ample security. It is for the interest of all, that every class should be prosperous. While one class prospers at the expense of another, we never can expect that our country can be so prosperous as she might and ought to be.

We give insertion to the communication of X, Y, Z, on "Agricultural Colleges and Model Farms," and we recommend it to the attention of all readers of this Journal. We respect the writer so highly, and we are so satisfied of his sincerity in his support of Agricultural improvement, that we should be disposed to give the preference to his ideas, on the subject of Agricultural Colleges and Model Farms, to our own, if they were at variance with our own, which they are not, except in a very trifling degree, easy to be reconciled. If other gentlemen interested in the improvement of our Agriculture, were to take the trouble of communicating their ideas occasionally, as our worthy correspondent has often done, they would greatly promote the cause we humbly endeavour to advocate. It would be a great advantage to have Agricultural subjects discussed freely and frequently, by parties who are compe-

tent to do so, if they would only take the trouble. Parties who may not be practical Agriculturists, might, nevertheless, be most useful correspondents to this Journal. We suppose those most competent to write on the subject would think it degrading to them to write for the Press. If it were a political Journal, we should have no connection with it, nor solicit correspondents to contribute to it. As it is a Journal solely and exclusively devoted to Agriculture; we presume to say, that it would not be degrading to any man in Canada, however exalted his rank or station, to contribute useful articles to it, that would be calculated to advance the improvement of our Agriculture, and the prosperity of our country. This is a matter that should interest every true friend of Canada. Many who read this Journal will be conscious that they are acquainted with facts relating to Agriculture, which might be useful to communicate to the public, but which, notwithstanding, they would sooner keep to themselves, than be at the trouble of communicating for this Journal. In reference to the communication of our respected correspondent, we hope the subject to which it refers will not be lightly passed over, as it is one of the greatest consequence to the rural population of Canada. The necessary expenditure, as he most justly observes, should be furnished by the country at large, as the country at large would derive the benefit of their establishment. If Common Schools and Colleges are partly provided for by the State, what more is required by Agriculturists, but that these Common Schools and Colleges should be made more appropriate and useful for them. It would, we believe, be possible to provide all we ask for Agriculturists, with very little increase of the present expenditure for education. What we ask for it, is that, instead of educating the children of the rural population for merchants, store-keepers, politicians, doctors,

lawyers, notaries, &c. &c. &c.; they should receive an education suitable for farmers, and which would enable them to practise their profession with greater advantage to themselves and for the community. We do not know any greater absurdity than providing an unsuitable education for the rural population, at their own expense, and we are certain no other class in the community would consent to such inappropriate teaching. Other classes would be far from consenting to be educated as farmers who proposed to follow other professions and trades during their after-lives. No class are so much condemned for their backwardness in adopting the improvements of the day as Agriculturists; but, according to our humble judgment, Agriculturists never had fair play, or a fair chance, like other classes—chiefly because it is other classes who manage public affairs for them, instead of themselves. We ask nothing that is unreasonable for Agriculturists—we only wish they should have an equal chance with other classes, when entering upon the employment of their lives. Other classes, at all events, learn much of the *theory* of their professions while they are being educated, farmers, on the contrary, learn nothing, and, perhaps up to the period of leaving school, have never read a line on the subject of Agriculture. It is a most extraordinary fact that this should be the case in 1850, when Agriculturists form nine-tenths of the population of Canada. It is, however, only a proof how very little Agriculturists have been able to do for their own advantage, notwithstanding their great numerical majority. We should be sorry to write one line to favour Agriculturists to the prejudice of other classes, but we should equally regret leaving one sentence unsaid, which we might state, to obtain equal advantages for them.

We have received seven small parcels of wheat from Joseph Eden, Esq., Secretary

of the Agricultural Society of the County of Gaspé, being samples of the several wheats that received the highest premiums at their last County Show. They vary in weight from 67 lbs. 10 oz., to 70 lbs. 4oz. the minot, and are all of excellent quality and bright colour, the latter proving that they have been well harvested, and that the County of Gaspé is well adapted for the production of wheat. We are sorry to say, that we cannot distinguish between each variety, so as to be certain what name to give each. We shall be much obliged to Mr. Eden to inform us, if in his power, what time each wheat was sown, and harvested. We shall then be able to manage next year, by sowing part of the samples, to determine, perhaps, what the varieties are. We are rejoiced to see such good samples of wheat coming from the lowest extremity of the Province, wheat that might compare with any raised in Lower Canada, certainly. Has the influence of the sea air anything to do with imparting so pure a colour to the grain? We should also be obliged to Mr. Eden to let us know something of the quality of the soil on which the wheat has been grown, and the mode of cultivation. These samples only confirm our opinion of the capabilities of the country for yielding excellent Agricultural products. If the samples are the fair average of the wheat grown by farmers who produced them, the farmers of the District of Montreal would do well to obtain some for seed next Spring, as it would be a very suitable change of seed.

We give insertion in this number to the address of the Committee appointed to manage the Industrial Fair or Exhibition to be held at Montreal next Fall. We hope it will be the means of bringing forward many valuable productions of Canada, both natural and manufactured. In the manufactured, we include the products of Agriculture, and we shall rejoice to see the latter creditable to our Agriculturists. We are aware that we are far behind

what is known as "High Farming," in the British Isles, and we are also conscious that our best samples of Grain here, are not equal to those of Britain; but we may, nevertheless, show very good products of our Agriculture, and with the exception, perhaps, of wheat, equal to any Agricultural products to be found on this Continent. We should be proud that we are able to do all this. There is nothing in our climate and soil to prevent it, but everything in both to favour it. We have very little doubt, that although we do not at present grow Fall wheat, it might be grown in Lower Canada, by a proper preparation for it, sowing in time, and in drills where possible. We do not make experiments here to prove what our soil and climate are capable of. There may be, it is true, experiments made occasionally, but not, certainly, as they should be, to secure success, nor do we do all in our power to secure this success. If any party feel confidence in experiments they have made, let them report them, and we shall then see whether all has been done that should be done, to give a fair chance of success. Want of sufficient means may often be the excuse for imperfect experiments, but this excuse would not hold good in all cases. Lands of suitable quality, well drained, prepared by summer fallow properly executed, limed and manured, if necessary, the seed sown in drills (which might be done without a drilling machine, by making small drills with a plough, sowing the seed broad-cast, and then harrowing), and sowing the last ten days of August, if possible, would be the method of making a fair experiment, so far as the preparation of the land, and sowing. This wheat should be hoed in the Spring once or twice at least. This would be giving a fair chance to Fall wheat, which we do not believe it ever had in Lower Canada. Any party acquainted with the Agriculture of Britain, must know that they would have no hope of a good crop of wheat, without preparing for it in this way, or, perhaps, a better. Let us compare our culti-

vation for wheat with this, and how shall we find it? We are disappointed when we do not obtain larger crops, without making the necessary preparation for their production. Whatever productions may prove to be, no doubt exists in regard to the excellence of our soil and climate. Our Agriculture may not be in the most flourishing condition, but it is a consolation to believe, that no neglect of ours can change the country from what it naturally is, and will continue to be one.

MONTREAL DISTRICT INDUSTRIAL FAIR.

TO THE PUBLIC OF CANADA.

The Committee of Montreal Industrial Fair beg to call the attention of the Public to a project that has already been brought under their notice, of holding a Grand District Industrial Fair in the City of Montreal, in September or October next, in connexion with the International Exhibition, to be held in London, in 1851.

The intention of the Committee is to give the public an opportunity of presenting for Exhibition specimens of the natural and manufactured articles of Agriculture, Commerce, Art, Scientific ingenuity and skill, and generally of every species of production that will represent the industry and resources of this country. From these, competent and approved judges will select such as may be deemed worthy of transmission to the Great Industrial Exhibition in London, in 1851.

In preparing specimens for the Exhibition, the Committee suggest that preference should be given to those that this Province can produce *advantageously*, and to improvements of a practical nature, which may, by becoming better known, be of value to the producer, and open up new sources or commerce, industry, and wealth, to the country at large.

It is of importance, that every article sent in for Exhibition, should have attached to it the price at which it may be sold, and to the specimens of Minerals, Earth, Ores, &c.,—the natural production of the country, and the raw materials of manufacture,—where they are produced, the distance from navigable water, the cost of procuring and transmission, and such other information as may regulate their value.

The Committee will place no restriction on articles offered for exhibition, that have been produced out of Canada, but they do not intend to give any premiums for such. They will, however, grant diplomas for the best specimens of every species of industry, from whatever

quarter they may be sent. It will be obvious that many of the articles offered for exhibition may not be selected for transmission to England but the Committee desire especially to impress upon the public the immense advantage that must accrue from a fair representation *among ourselves*, of the national resources of Canada, and the productions of her skill, ingenuity and industry. The action of the Committee has necessarily been limited, from the want of knowledge of what pecuniary means would be placed at their disposal: and the shortness of time in which this undertaking will have to be completed, renders it imperative on the Committee to make an earnest appeal to their fellow subjects, in the different sections of the Province, to enable them to know as soon as possible, on what amount of support they may ultimately rely. The scale upon which this important undertaking will be conducted must depend entirely on the amount of pecuniary support which it shall receive from the public.

The Committee with confidence invite the co-operation of all classes of the community, to enable them to make such liberal arrangements as will ensure the success of the undertaking in a manner worthy of the character and position of this Province, and of the invitation which we have received to compete with the other nations of the world, in a spirit of generous and friendly emulation. The Committee, therefore, trust that this opportunity of placing many of the comparatively unknown resources of this Province before the notice of the British public and of the world at large, will not be neglected, but that in every district of Canada, individuals and Local Committees will spare no exertion to procure and forward to Montreal the various articles that come within the lists of those admitted for competition, and in the production of which their localities particularly excel. For the purpose of forwarding the undertaking, the Committee invite immediate communication from all who take an interest in it, to whom they will furnish any information they may require on the subject, and all the encouragement and assistance in their power.

The Committee would particularly invite the co-operation of the Agriculturists, Mechanics, and Manufacturers of Canada, considering that the success of this important and patriotic undertaking depends very much on the zeal and earnestness with which they take up the subject, and the efforts they are willing to make in its behalf. As an inducement to competition, and from a desire to enable all to take a part in the Exhibition, the Committee intend offering *premiums* of different amounts for the best specimens of the following and other articles:—

AGRICULTURAL PRODUCTS.

Fall and Spring Wheat, Oats, Rye, Barley, Corn, Buck Wheat, Pease, Beans, Flax and

Hemp in fibre and seed, Hops, Tobacco, Balsams and Gums, Tanning Materials and Dye Stuffs, Medicinal Substances, Intoxicating Drugs, Butter, Cheese, Beef, Bacon, Lard, Salted Provisions and Wool.

HORTICULTURAL PRODUCTS

Vegetables, Fruits, Flowers, and Seeds.

WOODS OF CANADA.

Largest and Finest Specimens of various descriptions suitable for Export, or Manufactures, in Planks, not exceeding 6 feet in length.

MANUFACTURES.

Flour, Starch, Sugar, Syrup, Leather, Cordage, Glass, Porcelain and Pottery, Bricks and Tiles, Artificial Stones and Cements, Oils, Soap, Candles, Woollen, Cotton, and Linen, Straw Basket, Bark and Indian Work, Mats, Brooms and Brushes, Cabinet Work and Wooden Wares, Turnery, Saddlery, Boots and Shoes, Trunks, Book-Binding, Type, Artificial Flowers, Sleighs, Carriages, Cooper's Work, Models of Steam and Fire Engines, Iron, Machinery and Tools, Black and White Smith's Work, Cutlery and Jewellery, Silver Ware, Agricultural Implements, Glue and Bees Wax, Picture Frames and Gilding, Dentistry, Mathematical and Surgical Instruments.

MINERALS.

Ores of Iron, Lead, Copper, Silver, Gold, Nickel, Uranium, Chromium, Manganese, Barytes, Ochres, Soapstone, Asbestos, Materials for Glass-making, Dolomite, Magnesite, Strontian, Phosphate of Lime, Shell, Marl, Gypsum, Canadian Tripoli, Whetstones, Millstones, Granite, Building Stones, of various kinds, Marbles, Lime Stones, Water Lime Slates, Flag Stones, Lithographic Stones, Black Lead, Agates, Jasper, Labradorite, Hyacinth, Peat, Petroleum, Asphalt, Jet, Moulding Sand, Clay for Bricks and Pottery.

FINE ARTS.

Sculpture, Painting, Drawing, Carving, &c., Lithographic Printing, Typography, Ornamental Stucco Work.

ANIMAL KINGDOM.

Cod, Liver, Seal and Whale Oils, Fish, Furs and Skins, Castoreum, Moose and other Horns, Preserved Birds, Skins, Insects and Bones.

Indian Antiquities, and matters relating to the early history of this country.

It is particularly requisite that all articles admitted for competition should exhibit one or more of the following qualifications;—Increased usefulness, improved form and arrangement in articles of utility, superior skill in workmanship, new use of known materials, use of new materials or new combinations of materials.

Beauty of design in form and color, or both with reference to utility.

Cheapness relatively to excellence of production. The object or article must be *bona fide*

produced or manufactured in Canada, and as far as possible of materials the produce of Canada.

The above General List of Articles has been made with a view of giving an idea of the character of the Exhibition. The amount and distribution of the prizes will be published hereafter. The Committee trust that the means to be placed at their disposal will enable them to give premiums for the above enumerated articles, and such others as may tend to carry out the objects of the exhibition.

Parties who are desirous of contributing to the funds of the Association, will please remit to David Davidson, Esq., British North American Bank.—Treasurer to the Association.

All communications to be post-paid to the Secretary of the Association, Office No. 22, Great St. James Street.

JOHN LEEMING,
Secretary.

HORSE-SHOEING.

SIR,—I have often been surprised at the carelessness and inattention which farmers show in respect to having their horses properly shod: you will often see them working them on roads and gravelly places with nothing on but tea-slippers, loose shoes, half shoes, and even barefoot: they seem entirely to forget Franklin's proverb—"For want of a nail the shoe was lost, for want of a shoe the horse was lost, for want of a horse the rider was lost." Every extensive occupier ought to have a forge in his backyard, and his sons and ploughmen ought to know how to shoe a horse—at least, how to fix a remove, drive a nail, draw out a coultter, piece a sock, or weld a broken link, fork, &c. How often is a man's, and even a horse's day lost in waiting for such jobs to be performed by the village smith, even at the very busiest season. In going to distant towns with corn, butter, &c., the farmer, or driver, should ever have with him a shoe joined in the toe with a rivet, some horse-nails, and other nails, a hammer, twine, pack-needle, &c. Being thus provided and handy, how many delays and difficulties, even losses, would be avoided. Every person having the care of horses should know how to mend their tackling, and be attentive in doing so. But as these things are obvious to all, I think I need not dwell upon them, and sorry I am that it was necessary to allude to them at all; but I have seen many a careless farmer, some too proud, and some too dilatory, to mind their poor horse. What is more ridiculous than to see a *booted buck on a bad-shod horse*, his Mackintosh covering a worn-out galling saddle, his *kidskins* grasping a patched-up reins; or to see a farmer's wife, with silks, boa, and a veil fluttering from a *Tuscan*, drawn by a horse without a blinkers, his collar broken, haystuffed sack, or cushion for his straddle, and the axle-tree cursing her at

every revolution of the wheel, and even worse, the animal showing evident marks of bad feed, and hard treatment. To laugh at such persons is too light a punishment; they ought to be followed, and lissed, and shouted. But to return to my subject. To have a horse properly shod, good iron, and a skilful practitioner are requisite. The nails, at least, ought to be *Swedish*; the shoe to be nicely formed, and a *good fit*. Let the seat of the shoe be pared even and plain, so that the web may lie solid, and not press more on one part than another; more of the toe-hoof may be pared off than of the heel of the forefoot, for the weight of the fore quarters rests on the heels, and therefore they ought to be left somewhat higher than the toes. Let the sponges of the shoe be a little thicker and broader than the other parts, so that they appear somewhat outside, in order to guard the coffin, which is the strength of the hoof. In piercing, the holes should be directed towards the toe, and the nails ought to be driven in that direction, and not towards the heels, because the hoof is thicker forward more than backward, and, therefore, a better hold can there be taken. The punch and neck of the nails ought to be of the same size and shape, so that the nails fill the holes in the shoe exactly; nails of a wedge-shape in the neck are the best; this is little regarded by many smiths, who make the holes above as wide as below, and the nails of so great a shouldering that they cannot enter the hoof so as properly to fill it; the shoe rocks, and when the head or shoulder of the nail is worn, it falls off. The nail at first should be driven with a small hammer and light strokes till it has well entered. In shoeing fine, delicate horses, grease the points of the nails, that they may enter more easily. Drive the two talon nails first, then see whether the shoe stands fair or not; if not set it to rights; then drive in another nail. Let down the horse's foot and see if it fits evenly every part. If it appears more on one side than the other, lift up the horse's other foot, that he may stand firm on the shoe, then strike the side of the hoof where the shoe is scant with your hammer, and the shoe will come that way; drive in the other five nails then, when you rise the foot; and let their tops, when the points are broken off, form a circular line, not zigzagly, nor in and out, like the teeth of a saw; then clench them evenly with the hoof, which you may do by paring the hoof a little under the clench. This done, with your rasp pare the hoof, so that the shoe may appear all round, give it a rub of the rasp and that fore foot will be secured. Treat the other fore foot in a similar manner. When the feet are badly shaped, you must somewhat vary your operations, viz. :—

1st.—In the *broad hoof*, take as much as possibly can be spared off the toe with your butteris, but do not touch the quarters or heels at all, save only what may be requisite to make the shoe fit

evenly; drive five nails on the outside of the hoof, and four on the inside, because he wears more without than within. Let the shoe be also made answerable to the wear. A trench should be in every shoe to save the heads of the nails from wearing.

2nd.—In the *rough and brittle hoof*, which is usually weaker without than within, though for the most part better than other hoofs, the raggedness on the outside of the coffin should be rasped off, and the hoof anointed with *neat's-foot oil*. The shoe ought to be lighter than for other hoofs; the nails, five outwardly, and four inside.

3rd. The *long hoof* should be well pared at the toe, and the shoe made rounder there, that the breadth may take off the evil sight of the length. If the foot be *very long*, let the shoe disboard without the hoof. Use eight nails, as in the perfect hoof.

4th. The *crooked hoof*—In this hoof pare the unworn side even with the other. Pare the worn side as little as possible. Have the shoe thicker for the worn side than the other. Set it on with nine nails—five on the stronger, and four on the weaker side.

5th. The *flat hoof*, or, as it is oftentimes called, the *pumiced hoof*, should be shod with a broad-webbed shoe, for the more it covers the weak sole the better. It ought to be stronger inside, towards the ball, than outside. Let it be easy and long. Pierce it round the toe to favour the heel. Make ten nails for it. Leave the heel and ball as strong as possible, but pare the toe a little.

6th. The *hollow hoof* ought to be well pared, especially the seat of the shoe, in order to lessen the cavity within, which should always be kept moist with some *proper stuffing* to prevent *hoof-binding*. Make the shoe the same as for the perfect hoof, and the nails the same in number.

7th. As to *broad frushes* which cause weak heels, there is little or no need of paring, except for the seat of the shoe and a little about the toe, leaving the heels as strong as may be; but the shoe should be broader and stronger towards the heel than about the toe. Form the shoe like that for the perfect hoof, and set it on with nine nails.

8th. The *hoof with narrow heels* should have a broad web to defend the heels from the ground, and the sponges should nearly meet for that reason. Punch it towards the toe for eight nails, sparing the heel as much as possible.—*Vide Dictio. Rusticum, § unde decerp.*

9th. But I have said sufficiency, I think, with regard to shoeing the *fore feet*. I will now make a remark or two respecting the *hinder ones*. The forepart of the hoof of the *hinder feet* is weaker than the heels, and, therefore, should be spared in the paring, and defended and strengthened by the formation of the shoe, which should be stronger at the toe, and pierced higher the heel than the toe; and the outside

of the shoe should be made with a *calkin*, not over high, but let the other sponge be agreeable to the calkin, which is to keep him from sliding; but let not the calkin be sharp pointed, but flat and handsomely turned.

10th. *Far those hoofs that interfere.*—As they are generally higher on the outside than on the inside, pare the outside with your butteris well, and make the innerpart of the shoe the thicker, in order to rise that part and make him tread out. It should never have any calkin, for that would make him tread awry, and the hoofs sooner to interfere.

11th. *For paring and shoeing the foot that is half-bound.*—First pare the toe well, and the sole somewhat thin, then open the heels properly, and make him a *lunette*, or shoe, in the form of a new moon.

It may be necessary to observe here that the above remarks are intended only as applicable to farmers' horses; with hunters or racers I have nothing to do, or the *Kochlani* which would pass your horizon in the twinkling of an eye, and leave even the whirlwind behind. The shoeing of these I leave to more dexterous hands, and remain, yours, &c., JACOB THOMPSON DUNNE, *Cullennagh, Maryborough, May 24, 1850.*

The public are very much like children in the matter of fame. If you are constantly stretching forth your hands for it, they will find a curious, half-spiteful pleasure in putting away the previously offered wreath: while if you sit down in a state of perfect indifference, the chances are, they will come and crown you.

He who searches for words to clothe his thoughts does not know exactly what he wishes to express.

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GEORGE SHEPHERD.

Montreal, April, 1849.

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AGRICULTURAL JOURNAL, AND TRANSACTIONS

OF THE

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VOL. 2.

MONTREAL, AUGUST, 1880.

NO. 3.

We willingly give insertion to the prospectus of a work published in New York, by Leonard Scott & Co., entitled "The Farmers Guide to the Science and Practice of Agriculture," by Henry Stephens, F. R. S. E., author of the "Book of the Farm," assisted by John P. Norton, M. A., Professor of Scientific Agriculture at Yale College, New Haven. We have received the first four numbers of this work, and they are all that could be expected from gentlemen who are so well known to reading Agriculturists. We have seen Mr. Stephens' "Book of the Farm," and we have looked upon it as one of the best works on Agriculture that we are acquainted with. We can safely recommend "The Farmers Guide" to Agriculturists, as one of the best and most useful works they can purchase, so far as we can judge of the numbers published, and we have no doubt whatever that the forthcoming numbers will be fully equal to those we have seen, and that the highest character we could give of the work will be sustained to the end of the publication. We give the following extracts from the work.

But a book might be made an efficient assistant-monitor. If expressly written for the purpose, it might not only corroborate what the farmer inculcated, but serve as a substitute in his temporary absence. In this way the tuition of the pupil might proceed uninterruptedly. The usual deprecations against the acquirement of practical farming from books, would not apply to such a one. I would give no such counsel to any pupil. Books on farming, to be really serviceable to the learner, ought not to

constitute his sole study: the field being the best place for perceiving the fitness of labour to the purposes it is designed to attain, the book should only present itself as a monitor for indicating the best modes of farming, and showing the way of learning those modes most easily. *By it the practice of experienced farmers might be communicated to the pupil. By consulting that which had been purposely written for his guidance, while carefully observing the import of daily operations,—which are often intricate, always protracted over considerable portions of time, and necessarily separated from each other,—he would acquire that import in a much shorter time than if left to be discovered by his own sagacity.*

Such a book would be useful to every class of pupils—to him who, having finished his scholastic and academical education, directs his attention, for the first time, to the acquirement of practical farming, or who, though born on a farm, having spent the greater part of his life at school, determines, at length, on following his father's profession. For the latter class of pupils, tuition in farming, and information from books, are as requisite as for the former. Those, on the other hand, who have constantly resided on a farm from infancy, can never be said to have been pupils, as, by the time they are fit to act for themselves, they are proficient in farming. Having myself, for a time, been placed precisely in the position of the first description of pupils, I can bear sincere testimony to the truth of the difficulties to be encountered in the first year of pupilage. I felt that a guide-book would have been an invaluable monitor to me, but none such existed at the time. No doubt the farmer ought to possess the ability to instruct every pupil he receives under his charge. This is his bounden duty, which, if rightly performed, no guide-book would be required; but very few farmers undertake the onerous task of instruction. Practical farming they leave the pupils to acquire for themselves in the fields—theoretical knowledge, very few, it any, are competent to impart. The pupils, being thus very much left to their own industry, can scarcely avoid being beset with difficulties, and losing much time. It must be acknowledged,

however, that the practice gained by slow experience is, in the end, the most valuable and enduring. Still a book expressly written to suit the circumstances of his case, might be a valuable instructor to the pupil, in imparting sound professional information.

Such a book, to be a useful instructor and correct guide, should, in my estimation, possess these qualifications. Its principal matter should consist of a clear narrative of all the labours of the farm as they occur in succession, including the reasons why each piece of work is undertaken. While the principal operations are thus being narrated, the precise method of executing every kind of work, whether manual or implemental, should be minutely described. Such a narrative will show the pupil, that farming is really a systematic business, having a definite object in view; and possessing the means of attaining it; and the reasons for performing every piece of work in one way, rather than another, will convince him that it is an art founded on rational and known principles. By the perusal of such a narrative, with its reasons having a common object, it will impart a more comprehensive and clear view of the management of a farm in a given time, than he could acquire by himself by witnessing ever so many isolated operations. The influence of the seasons on all the labours of the field is another consideration which should be attended to in such a book. In preparing the ground, and during the growth of the crops, the labour appropriated to each kind of crop terminates for a time, and is not resumed until a fit season arrives. These periodical cessations from labour form natural epochs in the progress of the crops towards maturity, and afford convenient opportunities for performing the work peculiarly adapted to each epoch; and, since every operation must conform with its season, these epochs correspond exactly with the natural seasons of the year. I say with the *natural* seasons, in contradistinction to the common annual seasons, which are entirely conventional. Such a necessary and opportune agreement between labour and the natural seasons, induces a corresponding division of labour into four great seasons, bearing the same names as the annual seasons. Each operation should therefore be described with particular reference to its appropriate season.

If, by a course of tuition from such a book, the pupil could be brought to anticipate results whilst watching the progress of passing operations, his pupilage might be shortened by one year; that is, could a book enable him to acquire the experience of the second year, in the course of the first, a year of probationary trial would be saved him, and he would then learn in two years what at present requires three; and it shall be my endeavour to make *The Farmer's Guide* accomplish this.

Ploughman.—The duties of a ploughman are clearly defined. The principal duty is to take charge of a pair of horses, and work them at every kind of labour for which horses are employed on a farm. Horse labour on a farm is various. It is connected with the plough, the cart, the sowing-machines, the roller, and the thrashing-mill, when horse-power is employed. In the fulfilment of his duties, the ploughman has a long day's work to perform; for, besides expending the appointed hours in the fields with the horses, he must groom them before he goes to the field in the morning, and after he returns from it in the evening, as well as attend to them at mid-day. Notwithstanding this constant toil, he must do his work with alacrity and good-will; and when, from any cause, his horses are laid idle, he must not only groom them, but must himself work at any farm-work he is desired. There is seldom any exaction of labour from the ploughman beyond the usual daily hours of work, these occupying at least 12 hours a-day for 7 months of the year, which is sufficient work for any man's strength to endure. But occasions do arise which justify a greater sacrifice of his time, such as seed-time, hay-time, and harvest. For such encroachments upon his time at one season, many opportunities occur of repaying him with indulgence at another, such as a cessation from labour in bad weather. It is the duty of the ploughman to work his horses with discernment and good temper, not only for the sake of the horses, but of the work he executes. It is also his duty to keep his horses comfortably clean. Ploughmen are never placed in situations of trust; and having no responsibility beyond the care of their horses, there is no class of servants more independent. There should be no partiality shown by the master or steward to one ploughman over another, when all do their work alike well. An invidious and reprehensible practice exists, however, in some parts of the country, of setting ploughmen to work in an order of precedence, and which is maintained so strictly as to cause the men to go and return from work in the same order, one being appointed *foreman* or leader, whose movements guide those of the rest. Should the foreman prove a slow man, the rest must not go a single hour more than he does; and if active, they may follow as best they can. Thus, whilst his activity confers no superiority of work beyond his own, his dulness discourages the activity of the other ploughmen. This is sufficient ground for farmers to abolish the pinctice at once, and place the whole of their ploughmen on the same footing; I soon felt the evils attending the system, and put an end to it on my own farm. When one ploughman displays more skill than the rest, he is sufficiently honoured by being intrusted to execute the most difficult species of work, such as drilling; and such a preference gives no un-

brage to the others, because they are as conscious of his superiority in work as the farmer himself. The services of ploughmen are required on all sorts of arable farms, from the carse-farm to the pastoral, on which the greatest and the least extent of arable land is cultivated.

Dairy-Maid.—The duties of the dairy-maid are well defined. She is a domestic servant, domiciliated in the farm-house. Her principal duty is, as her name implies, to milk the cows, to manage the milk in all its stages, bring up the calves, and make into butter and cheese the milk obtained from the cows after the weaning of the calves. The other domestics generally assist her in milking the cows and feeding the calves, when there is a large number of both. Should any lambs lose their mothers, the dairy-maid brings them up with cow's milk until the time of weaning, when they are returned to the flock. At the lambing season, should any of the ewes be scant of milk, the shepherd has his bottles replenished by the dairy-maid with warm new milk to give to the hungered lambs. The dairy-maid also milks the ewes after the weaning of the lambs, and makes cheese of the ewe-milk. She attends to the poultry, feeds them, sets the brooders, gathers the eggs daily, takes charge of the broods until able to provide for themselves, and sees them safely lodged in their respective apartments every evening and, sets them abroad every morning. It is generally the dairy-maid, where there is no housekeeper, who gives out the food for the reapers, and takes charge of their articles of bedding. The dairy-maid should therefore be an active, attentive, intelligent, and skilful person.

On the Branches of Science most Applicable to Agriculture

I believe I have said enough on the best means, in existing circumstances, of acquiring a thorough knowledge of practical agriculture, it is now incumbent on me to indicate those branches of science which will most enlighten the mind of the pupil for the most ready appreciation of agricultural practice; and I may, perhaps, excite general surprise, when I state that no art bears so close a relation to so many branches of science as agriculture.

Indeed agriculture may perhaps be considered one of the experimental sciences, as its principles are no doubt demonstrable by the test of experiment, although farmers have not yet attempted to deduce principles from practice. The necessity for such a deduction is, no doubt, the less urgent, that husbandry is usually pursued as a purely practical art; and the facility of thus pursuing it successfully of course renders practical men indifferent to science, as they consider it unnecessary to burden their minds with scientific results, whilst practice is sufficient for their purpose. Could the man of practice, however supply

the man of science with a series of accurate observations on the leading operations of the farm, the principles of these might be truly evolved; but I conceive the greatest obstacle to the advancement of scientific agriculture is to be sought for in the unacquaintance of men of science with practical agriculture. Would the man of science become acquainted with practice, much greater advancement in scientific agriculture might be expected than if the practical man were to become a man of science! because men of science are best capable of conducting scientific research, and, being so qualified, could best understand the relation which their investigations bear to practice; and, until the relation betwixt principles and practice is well understood, scientific investigation, though important in itself, and interesting in its results, would tend to no practical utility in agriculture. In short, until the facts of husbandry are acquired by men of science, these will in vain endeavour to construct a satisfactory theory of agriculture on the principles of the inductive philosophy.

If the science of agriculture in its present position be thus correctly represented, it may be expected to remain in an incipient state until men of science become practical agriculturists. or, what would still prolong such a state of lethargy, until farmers acquire scientific knowledge. It is certainly remarkable that so few scientific men were for a very long period induced to subject agricultural practice to scientific investigation; though of late many, both at home and abroad, have devoted a portion of their time to such a study, and which has already afforded abundant proof, that extensive as the field of research is, it has only to be occupied by numerous observers to produce results interesting alike to the man of science and the man of practice. The long neglect of agriculture by scientific men may perhaps have arisen from the circumstance of its having so intimate a relation to almost every physical science, so that until all its relations were first investigated, no sufficient data could be obtained for a satisfactory explanation of its practice. A short review of the actual relation which the physical sciences bear to agriculture will render this suggestion the more probable.

The sciences which agriculture most immediately affects are mathematics, natural philosophy, chemistry, natural history, comparative anatomy, and veterinary science. Of mathematics, the most useful parts are geometry and trigonometry, and the application of these to the measurement of surfaces and solids. Without a knowledge of mathematics no one can understand natural philosophy; because it is they alone which can demonstrate the powers of those laws which determine the motion of matter. Of natural philosophy, the most useful branches to the agriculturalist are *mechanics*—

"the science of the laws of matter and motion, so far as it is accessory to the construction of machines which, acting under those laws, answer some purposes in the business of life," such as the culture and manufacture of crops; *pneumatics*, "that branch of physics which treats of air, and the laws according to which it is condensed, rarefied, or gravitates;" *hydraulics*, that branch of hydrodynamics which treats of fluids in motion, and in particular of the conveyance of water through pipes and channels; *electricity*, which endeavours to determine "the operations of a principle of very wide influence through nature;" a cause which is, and perhaps can be no otherwise conceived, than as a highly attenuated form of matter existing in different substances, and passing from one to another, with various effects, among such bodies as can be excited to give or to receive it;" *optics*, by which the laws of light, as affecting vegetation by the influence of colour, are investigated; and *heat*, which by diffusing itself through neighbouring substances, gives to every object its existing form. By the aid of chemistry, "the manufacture of manures may be expected to continue to improve the supply of manure further augmented and cheapened, and the development of the resources of the soil thereby hastened and increased." Of the branches of natural history, the most useful to agriculturists are, "meteorology, the science of the atmosphere and its phenomena;" *botany*, "which treats of the structure, functions, properties, habits, and arrangement of plants;" and *zoology*, as restricted to the natural history of quadrupeds and insects. The branches of the medical science useful to agriculturists are *comparative anatomy*, which treats of the structure of the bodies of animals as compared with that of the body of man; and *zootomy* which treats of the structure and explains the principles of the art of healing the diseases of the domesticated animals.

Viewing the general aspect of these sciences as presented to the agricultural pupil, in the definitions just given of them, he must at once observe the advantages he would derive by studying them. It is well observed by Sir John Herschell that, "between the physical sciences and the arts of life there subsists a constant mutual interchange of good offices, and no considerable progress can be made in the one, without of necessity giving rise to corresponding steps in the other. On the one hand, every art is in some measure, and many entirely, dependent on those very powers and qualities of the material world which it is the object of physical inquiry to investigate and explain." It is evident that most farming operations are much affected by external influences. The state of the weather, for example, regulates every field operation, local influences modify the climate very materially, and the nature of the soil generally determines the kind of crop

that should be cultivated. Now the pupil should desire to become acquainted with the causes which give rise to those influences, by understanding the laws of nature which govern every natural phenomenon. The science which investigates those laws, is called *Natural Philosophy*, which is divided into as many branches as there are classes of phenomena occurring in the earth, air, water, and heavens. Those who being unerring in their operation, admit of absolute demonstration; and the science which affords the demonstration is called *Mathematics*. Again, every object, animate or inanimate, possesses an individual character, so that it can be identified, and the science which makes us acquainted with its characteristics, is termed *Natural History*. Farther, every object, animate or inanimate, is a compound body made up of certain elements, of which *Chemistry* makes us acquainted with their nature and combinations. The pupil thus sees how suitable those sciences are to the explication of the phenomena around him, and their utility will be the more apparent to him, the more minutely each science is investigated.

THE HONEY-BEE

The honey-bee belongs to the genus *Apis*, and is also the only one of that family that is gregarious with us throughout the year. Its history and economy have been studied in all ages; and though an exotic to us, it is met with in almost all climates, both in a wild and domestic state. When it was introduced into this country has not been ascertained. It is not indigenous, and this may account for its being less hardy than the humble bee, and not so lively an insect as the wasp. It is frequently at home, while they are busily employed abroad, both early and late. A complete colony of bees consists of three kinds—queens, drones, and workers; but strictly speaking, of only two; that last being only females in an undeveloped state. Their number in a strong colony amounts to many thousands; they are of a light brown colour, but become darker with age, and have dull tarnished wings. On their hinder legs they have strong curved hairs for holding the pollen or dust, which they collect from the anthers of flowers. Their usual term of life seems to be about a season, or six months; their places are quickly filled up by the increase of young bees; which are of a light colour when first hatched. These vary a little in size, which may be caused by the irregular size of the cells in which they are bred; which is observable in the case of small drones which happen to be reared in workers' cells. This difference in size has led some of our leading writers to consider that there are different sorts of bees for various occupations; but we maintain with Golding, that working bees are "ser-

vants of all work," and that all of them are "equal to all occupations."

The drones, or male bees, have been abused by almost all writers; but without their presence at the usual season, in May, and June, a colony would soon be useless. They have no sting, are very harmless, appear to number from 100 to 200 in a hive; they are thicker than the workers, but of similar colour, and shorter than queens. As they never visit flowers they require no strong hairs on the hinder legs to hold pollen, and accordingly are not furnished with them. They take no part in the construction of the cells, nor seem to take any interest in the hive; they seldom leave it except in the middle of warm days, and make a buzzing noise readily distinguished from the hum of the workers. Nothing satisfactory is known of their real use and character, except that they concur with the queens in the increase of their species; but when, or how is uncertain. Most apianians, following Hubers' opinion that they meet in the open air, complain of their number as superfluous; but it should be known, that the males in hive are few when compared with the workers, who in reality, are barren females, and also that they come at the time of plenty, when their number tends to keep up the requisite heat in the hive, by which more collecting bees can be spared abroad. As the season draws to a close, they are all destroyed by the bees. Some writers recommend assisting the bees in the slaughter, but that seems needless; for their hatred is raised to such a pitch, that it extends even to the larvæ in the drones' cells, which are afterwards usually filled with honey. It sometimes happens that the drones are spared. In such cases, it is supposed that some misfortune has befallen the queen bee, and that their presence is wanted till another is bred. And it also happens, though rarely, that drones are hatched late in the Autumn. This agrees with what we are told respecting bees in hot countries repeatedly swarming during the year; but evidence cannot be obtained with us concerning the time that elapses between the swarming period. Neither is the precise age of the drone bee known; we have seen them, however, alive at the end of November.

The queen or head bees are readily known from the workers or drones, by the greater length of their bodies, which make their wings appear shorter. They vary a little in size, according to the cells in which they happen to be bred, some being scarcely larger than common bees. They are of a similar colour, and their sting, which we never knew them to use, even though provoked, is bent. Unlike other bees, they live several years, and what is more remarkable, seem to increase in size with age, a thing at variance with the rule that insects complete their growth in the nymph state.

Much has been said in praise of the queen bee, but she is less active than the workers, and is helpless without them. They certainly are greatly attached to her; still they do not pay her all the homage which some imagine. She is seldom seen abroad, her sole occupation appearing to be depositing eggs.

Of Wax and Comb-making.—Though some in our day pretend to have revealed the mystery of comb-making, we may, with safety, say, that of the manner in which bees build their combs, we know but little beyond this—that they are of wax, which exudes like a sort of perspiration, in small scales, through the segments or rings underneath their bodies, as they cluster together to cause heat. Some of the flakes may be seen upon the floor of a common hive, that have fallen from the bees when they commenced comb-building. They begin one comb at the top of their hive; and it may contain both a little honey and some eggs on the second day, when only about the size of an oyster shell then another is begun, and so on, the centre ones always being in advance, until the whole number reaches within about half an inch of the floor; space enough to allow free egress from the combs. A common hive may contain seven or eight divisions of combs, generally arranged in parallel lines, north and south, which a strong colony, in good weather, will construct in a fortnight. During the process, in glass hives, some of the bees may be seen having scales of wax oozing out from their bodies; other are busily employed in masticating these scales, and forming cells with their strong mandibles or jaws, surrounded by other bees clinging together in every way. Much has been said in praise of these cells, but in reality they cannot be compared with the hexagonal cells. In fact, they are more like those of humble bees inverted. We know of no writer who has noticed that bees can also eject wax from their stomachs or mouths; a thing easily observed when they are at work without clustering, in a bell glass, on the top of a strong colony. It is more questionable how they come by the wax, which differs but little from that obtained from plants. The fact, that bees frequent young shoots, and the underside of the leaves of plants abounding with wax, especially common laurel, when comb-building, led us to think that they previously collected and refined it by the curious process already noticed. But Bevan, and others of good authority, adopt Hunter's opinion, that wax is an excretion of oil, produced solely by the bees; though the manner in which it is produced seems beyond the "ken of Faraday or Leibig."

Besides the wax above noticed, bees make use of another substance, of a resinous and glutinous nature, called *propolis*. With this they lay the foundation, varnish their cells, and stop up all little crevices. During hot weather,

they collect much of this substance from the buds of trees, and carry it home on their hinder legs, as they do pollen. And though the fact is known to every school-boy, still naturalists have not clearly shown how the little balls accumulate. When bees are collecting pollen, especially on bell or pea flowers, they use their fore feet, which are hairy, as a brush, to convey the farina into the basket on the hinder legs already noticed. While this is going on they frequently mix it with a little honey from their trunks, in order to make the powder adhere to the surrounding hairs, which are like eye-lashes. Their form gives shape to the substance which varies in colour, according to the flowers they frequent. It is surprising with what accuracy the balls are formed of equal size; if they were otherwise, they would, of course, hinder the flight of the bee, by their unequal balance. One must be a patient and close observer to notice this, or he may be induced to take for granted what a writer in the *Quarterly Review*, vol. 71, states on this subject: "when bees collect pollen, they will at times, roll and revel in a flower, like a donkey in a dusty road." It is true that bees are dusted or powdered whilst among flowers; but they collect no powder to store up, except what is on their legs. After depositing the little balls by merely placing their legs in the cells, and quickly brushing off the pollen into them with their fore feet, they issue forth again almost as dusty as when they entered the hive. What happens to fall from them tends to darken the combs, and soon makes them look old. The anxiety of bees to collect pollen is as great as their desire of honey, the one being as essential to the prosperity of the colony as the other. We doubt the assertion, that they lay up more than they want, and that "its decomposition becomes to them a sore trouble and annoyance." Bees are good chemists, and know how to preserve it with honey, as proper food for their young. The young bees are bred from eggs. The queen bee lays all her eggs in a colony, however weak or strong it may be. The proper cells for their reception are, in general, in the heart of the hive; consequently, it is not easy to see her thus engaged. She deposits one egg, or rarely two, at the bottom of the cell; and the combs being placed perpendicularly, the eggs, of course, rest in an horizontal position, and not on one side of the cell, like the eggs of wasps. When thus employed, she is not attended by a host of bees paying her homage, as some imagine. In fact, those that happen to be near her, seem to take no more notice of her than they do of their neighbours.

Many thousands of eggs are laid early in Spring, long ere the queens of the wild bees have left their solitary hiding places in the ground; and about the time that they appear, about the first of March, or middle of April, the queen of the hive bees is surrounded by a numerous pro-

geny, and has begun to lay drones' eggs, and in a few days later will deposit those for queens.

The eggs are hatched in about four days, by the warmth in the hive, from the bees on the combs. At first, the grubs lie in a curved position, at the bottom of the cells. As they advance in growth, they lie horizontally, with their heads towards the entrance, and are fed by the bees with pollen, probably mixed with honey, and adapted to the age of the grubs. After six or seven days, the larvæ close the openings of the cells by spinning a sort of web over them. More protection than this is not required, except a coating of wax, which the bees give the web or mouth of the cells, in order to stand against the traffic in the hive. When the larvæ of bees are thus entombed, they are at first soft and milky, and thus continue even after they take the insect form; they gradually change colour, harden, and in about eight days come forth bees of a silvery colour, while the cells are again replenished with more eggs or honey, according to their position in the hive. The larvæ of drones are hatched in the same way, but the time of their growth is less than that of the queens. The queen cells are not originally constructed of full size, otherwise their necessary depth would, in some measure, prevent the proper attention required. We pay no attention to what is called royal jelly, as the peculiar food for queens, but consider their diet to be the same as that of other bees. It may be remarked, however, that owing to the position of their cells, they are reared like hornets and wasps, with their heads downwards—that is, the cells are inverted, and they have room to move a little in them. We never could discover openings in the cells for admission of food, as noticed by most writers; still, as the inmates are evidently in an active state at times for several days in the cells, they may be fed before leaving them. During that time they emit a piping sound like *off, off*. But a few days, sometimes nine, previously, the old queen is already off, and has left the hive with a numerous progeny of all ages; this is called a swarm.—*Cyclopedia of Agriculture*.

Swarming.—The way that honey bees form fresh colonies differs from that of wild bees, whose queens begin their nests in Spring alone, while those of the hive bees are surrounded by thousands, and would be helpless indeed without them, incapable even of forming a cell or providing for themselves. Much doubt prevails respecting what causes them to break off into colonies; and we can only say, that nature has wisely ordered that to be the way to increase their species. Apianians have paid great attention to this subject, in order to come to a proper conclusion as to what induces bees to swarm. At all events, a knowledge of it is very essential towards their culture. In general, they agree that want of room hastens off the first swarm, led by

the old queen; but this cannot be said of after swarms, for they come forth, room or no room. Rivalry of the queens seems to be the primary cause; for however crowded a hive may be, the queen will not quit with a swarm until more are in the field to dispute her sway. It is true, that the old queen leaves a few days before her successors appear, but she knows, of course, when to expect them; and if the swarm is delayed by bad weather, rivalry and piping commence as before the first swarm. It is to be remarked, that working bees know by instinct about the time they are to quit their hive, and at times sally out without the queen, but return as soon as they miss her: they frequently have another home cleaned out beforehand, especially the first swarms. In these it sometimes happens that there are no drones, whose appearance, with the clustering of the bees outside the hive, are generally the first signs of swarming. This may be owing to the forward state of the young queens and the crowded condition of the hive. First swarms are always the strongest, and the bees are well stocked with provision to begin fresh structures. They usually muster on a branch or bush near the hive, and are readily taken, though at times they fly direct to an empty hive in the neighbourhood, or a cavity in an old wall a mile or two off. So much do they prefer a place of their own choosing, that they will sometimes quit a hive when their owner imagines that he has secured them. The old stock may be said to be without a head for six or nine days, according to circumstances, till another queen is hatched. Then she begins to attack her rivals in the cells, and utters the shrill sound *peep, peep*, while the imprisoned ones cry *off, off*. This is termed the calling of the queen bee, and the evening is the best time to hear these remarkable sounds in a hive, which go on night and day until one or more rivals appear. Then a general uproar ensues in the hive, and another swarm issues, perhaps on the third day after the sound began. The same process goes on with the next, which is smaller in population, and at a shorter interval, corresponding with the time between the laying of the queens' eggs and the state of the weather. It is stated, on good authority, that the bees prevent the queen destroying her rivals, and that they quit by seniority. We have seen her attacking them in the cells without resistance on their part, and it often happens that several queens quit together in one swarm. Some newly hatched can scarcely fly; therefore it can hardly be said that they depart by rotation. It appears that one is supreme at the departure of a swarm, and that she drives out all other rivals that happen to be bred. A worse fate attends them immediately when the swarm settles; they are destroyed by the bees, or more likely by the head queen, for queens are such enemies that they will sting one another to death when confi-

ned and separated from the bees. The succeeding swarms certainly have not the instinct or care to provide themselves with a future place of abode, like first ones. They often fly from place to place, and if not disturbed, will sometimes begin comb-building on a branch. We possess combs that contained both honey and brood, taken from a hedge. This may be accounted for in two ways, either by their being suddenly driven from the hives by the rival queens, or by a partial instinct in bees for a warmer climate. The reader may perceive that we consider swarming to be a natural instinct; and one not easily prevented, especially when the colonies are in good condition. Additional room is considered the best remedy; but if this be delayed till April, or until eggs for queens are laid, a thing not easily known, it will be fruitless; neither will the wary bee-keeper depend much on shading or ventilating the hives, nor even upon the destruction of the young queens, which might only retard swarming until more were reared to the injury of the colonies.

In connection with this subject, we may mention that bees seldom sting during the time of swarming, having no store to defend. We have just returned from securing two swarms; one of them was on a branch, which we cut off, and brought the suspended cluster down, and merely put the mass of bees on the ground with a hive over them, of which they readily took possession. The other was settled round the stem of a gooseberry bush; a hive was put over the bees which seemed unwilling to quit the bush, but after a little rousing by a stick, they ascended into the hive. Both will be removed in the evening to their proper place of abode. There is little or no occasion for rubbing the hives previously with sweet mixtures, or fencing off the sun, unless in great heat. Bees pay remarkable attention to their queen, while forming fresh colonies. Wherever she alights they cluster round her, as if their sole existence depended upon her. Nevertheless artificial colonies may be made without her presence, by merely putting a part of the bees into a hive in which there is a bit of comb containing workers' eggs, and confining them for a day. From one of those they rear a perfect female or queen, by widening and lengthening the cell, to complete the growth of the insect, whose cell is not invetted, but in the same position as those of the workers. Some recommend this plan when bees cluster and lie idle outside the hive, especially before the first swarm. Such experiments, however, are but hazardous, and at best only make weak colonies. Indeed, it may be asked, what is gained by premature separation? If done in bad weather there is, perhaps, an injury; for of what use are bees in an empty hive at such a time? If the weather were good, a few days might be sometimes gained, but when the unnatural disturbance of the hive and the uncertainty of suc-

cess are taken into consideration, we think the scheme is best let alone. Indeed, the practical bee keeper has more reason to complain of the propensity of bees to increase colonies, which prevails so powerfully, that a strong stock will sometimes throw off four or five swarms, while the first of these may cast off two also during the season; and we have known an instance of the original head bee of a hive having established three in one season. This great increase strengthens our belief, that bees were originally natives of a hot climate, where they would repeatedly swarm, and collect store during the whole year, as they would with us if we had no winter. And thus we may conclude, that they have no foreknowledge of winter, and that the primary cause why bees collect store of both honey and pollen is merely to enable them to increase their species.

Management of bees.—In rural economy the management of bees is interesting, and it is best to begin with a strong, early swarm, which may be purchased for 10s. and should be placed, if possible, in its abode in the evening of the same day that the bees left the stock; or a good, old colony, at £1, removed late in autumn or in Spring, before the bees begin to collect store. In removing old stocks, care must be taken to carry the hives level, otherwise the combs may be disturbed. A warm corner, open to the south, is the best spot for the hives, sheltered from the weather and very hot sunshine, otherwise the combs might melt, of which we have known instances. Water ought to be near at hand; it matters not how filthy. Success, of course, depends much on the pasturage and management. It cannot be expected that bees can prosper in large, agricultural districts, where they have to fly at times over hundreds of ploughed acres ere they can even come to a flower. Now and then they may fall in with seed turnips, a rich field of white clover, or buck-wheat, all of which afford much honey; but gardens, woody or heath countries, abounding in wild flowers, afford the most lasting pasturage, where bees thrive best, on whatever plan they are kept.

In general, hives are made of wood or straw, and vary in shape and size according to fancy; but we prefer *bar-hives* made of straw, such as were in use amongst the ancient Greeks—a proof of their skill in the management of bees, since no other hive can be so readily inspected by the removal of the combs.

The common straw-hives with but little trouble, will make very good bar-hives, which are indeed more easily managed than those in common use. The following is the substance of a notice of the Greek hive, in the *Gardener's Chronicle* for 1845. The best hives are made of straw, which is the most suitable material, and resists the heat and cold better than wood; and according to Bevan, who has paid much attention to this hive, it should be of a round form,

thirteen and a quarter inches in diameter at top, and tapering gradually downwards to twelve and a half inches. This admits of eight bars, which should be one one-eighth of an inch broad, and half an inch in depth. The bars of wood are placed parallel, north and south, on the top of the hive, on which there is a wooden hoop, having a rabbit to receive them. A small piece of fresh comb ought to be fixed on two or three of the centre bars, as decoy combs; otherwise the bees may depart from their common rule, by placing their combs the reverse way. With the assistance of a lighted candle these pieces of comb may be made to stick readily to the bars. This of course is only required at first with a new hive, which should be covered with a lid of straw, fitted close to its sides, and there ought to be an exterior band or two on the top, for the lid to rest upon, to give the whole a more finished appearance. The precise width between the bars must be attended to, especially in the centre, and if there is room to spare, give it to the side ones, for they are considered to contain honey combs, whose cells are often of an unequal depth. No sticks must be in the hives as props for the combs; they would prevent their extraction, for the honey is obtained by removing the bars, to each of which a comb is attached. The middle of a warm day is the proper time for the operation: indeed that is the best time to extract combs from all sorts of hives, there being fewer bees at home, and all being busily occupied, they take less notice of the theft. The bees that happen to be on the combs soon return to the hive, and are not so apt to sting as in the evening. We may remark, that laden bees returning to the hive seldom sting like those that issue forth; the same thing is observable with wasps. There should be duplicate bars to fill the places of those taken away, and if the lid does not fit close to them, a sheet of strong brown paper had better be placed tight over them, to prevent the ascent of the bees above the bars. Any common hive near the size specified can be easily made into a bar-hive, by merely cutting off the top and inverting it. The honey should be taken from these hives, as well as from all other kinds, as early as possible, in order to give the bees time to store up enough for winter.—*Cyclopedia of Agriculture.*

Lectures on the study of Chemistry, and Discourses on Agriculture. By JOHN DAVY, M.D. F.R.S. L. & E., &c. London: Longman, Brown, Green, and Longmans.

The learned Doctor has introduced a series of papers on "*the Atmosphere*," "*the Earth*," and "*the Ocean*." These are more interesting to the general reader. The agricultural reader will judge better of the work from the following extract, which we take from the Doctor's third discourse, "*On Manures and the Principles of their Action*."

Plants and animals have in common the distinctive property of reproduction, a power exercised by means either of a bud, slip, seed, or ovum, the seed of one being analogous to the ovum of the other; whilst the bud or slip manner of generation are common to both, and constitute one of their most remarkable links. Having a common mode of origin, so they have of growth: as the animal grows, not like the mineral from accretion from without, but by deposition from within, so likewise does the plant. Both plants and animals are nourished by, and owe their growth to, foreign matter introduced from without; and both cease to grow, both waste, and ultimately perish, if the foreign matter constituting their food be withdrawn. To both, warmth, light, air, and moisture are in certain degrees, essential to their well-being; and to both, in other degrees, these are injurious. Whilst there are thus certain resemblances between plants and animals, there are also marked and characteristic differences. The two most remarkable are intimately connected with the subject under consideration—the kind of food required by each, and the kinds of organs belonging to each for its reception. A mouth and stomach appear to be essential to the animal, in which the food taken is prepared, more or less, for distribution and nourishment. In the plant, the preparation appears to be external, viz. in the soil, from whence the nutritive fluid is absorbed by the delicate roots, and by them conveyed for distribution where required. As to food, animals are dependent for their support on one another, or on vegetables. Plants, on the contrary, are not so dependent; they derive their support from the soil and from the atmosphere: and whilst animals, in the act of supporting themselves, convert organic into inorganic matter, vegetables in their growth have the opposite effect—they create or form organic or inorganic materials; are, in brief, organizers for the sustentation of animal life. Let us take an example:—A single seed of Guinea corn (*Sorghum vulgare*), weighing about a quarter of a grain, planted in an artificial soil composed of several earths, and containing a little phosphate of lime, and salts of the vegetable and volatile alkali, under favourable circumstances, with sufficiency of moisture from rain, will rapidly vegetate, give rise to a plant many feet in height, and in less than six months yield a ripe head of corn, weighing, in its dry state, 1685 grains and containing 3537 grains of seed; for such I have found to be the weight of a head of average size, and such the number of the seed it contained: the weight of the seed alone was 1460 grains. What a vast increase is here! And if we examine the parts of the plant, its roots, its stem, its leaves, its seed, we shall find them composed of substances differing altogether from the materials which had constituted the food of the plant; a difference depending on a new combination of

elements,—on a change, in brief, from inorganic compounds.

There is another point of difference, and a very interesting one, between plants and animals—the effect on the atmosphere, comparing the leaves of the one with the lungs of the other. Animals inhale common air, consisting of azote and oxygen; a portion of the latter disappears, and its place is supplied by carbonic acid, which is a compound of carbon and oxygen, and which is expired; and consequently, in respiration, animals are consumers of carbon, and its consumption is attended with the production of animal heat. Vegetables, on the contrary, absorb, or take in carbonic acid, and exhale oxygen, by their leaves, and, consequently, are accumulators of carbon, and it may be, have the effect, in evolving oxygen, of occasioning a reduction of temperature, or of creating a cooling process. Should this be proved to be the case, it will be another example of wise and most happy adaptation.

I have spoken of vegetables as organizers, or the producers of organic compounds for the support of animal life: taking another view, animals may be considered as performing a part as essential to vegetable life, that of disorganizers; what is excrementitious from them being so reduced as to have the character rather of inorganic than of organic compounds; whether it be carbonic acid, with which they contaminate the air in respiration—their gaseous excrement—or their liquid and consistent, derived from the other excreting organs and passages of the body. These matters, which are destructive to animals, and not only to the animals that void them but to animals generally, may be held to be the highest kind and most appropriate food of plants. And the more we reflect on this, the more we are convinced of its truth, the more we must admire the connection and mutual dependence. The animal enriching the air for the use of the plant, and the same in the regard to the soil, offer a lesson to man of a very instructive kind, most beneficial when carried practically into effect, most injurious when neglected: in the one instance insuring fertility, and, I may add, salubrity; in the other, the production of sterility and disease.

Let us now, for a moment, take a glance at the composition of plants and animals. Both may be considered as composed of nearly the same elements, few in number, but variously united, so as to give rise to very many different compounds. The principal constituent elements of both are carbon, hydrogen, and azote, oxygen, lime, potash, silica, and phosphorus. Of these, carbon and silica preponderate in plants (silica, indeed, strictly is confined to plants); azote and phosphorus preponderate in animals. In plan is a large proportion of carbon and silica are expended in forming the woody fibre, the framework of the vegetable structure, and the epider-

mis, the resisting outer covering; whilst in animals, the azote and phosphorus are as largely expended in producing the organs of locomotion, the muscles and bones. And in each instance we witness the usual happy economy of nature, and fitness of means to an end. Plants, being fixed to the soil, take from it that which is almost always abundant in a fertile soil,—silica, a substance, even in a thin and delicate layer, imparting great power of resistance, and far less soluble when acted on by rain than the less common, or at least less abundant, phosphate of lime. Animals, on the contrary, being able to range abroad in quest of food, select such kinds as contain phosphate of lime and azote, and these kinds such as admit of digestion and assimilation, and of conversion into bone, muscle, &c.; following, in so doing, their natural tastes, undoubtedly instinctively directed.

Leaving these general views, it may be well to consider the subject we have entered upon somewhat in its details.

Physiologists who have directed their attention specially to the food of animals have arrived at the conclusion that, amidst the extraordinary variety of articles capable of supporting animal life, there are three which may be considered as of most importance, and, as it were, elementary alimentary substances—substances which are found in milk, viz., an albuminous matter, the curd; an oily matter, the cream; a saccharine matter, the sugar of milk. It seems to be proved, by a wide induction of facts, that articles containing these substances, or their analogues, such as starch for sugar, muscle for curd, any kind of fat for cream, are fit for the food of animals generally, and that no articles are fit that do not contain more or less of these. These substances, taken into the stomach, are converted into a pulraceous semi-fluid chyme; from whence a milk-like chyle is formed; and from whence blood, by which every part of the body is nourished in its constant circulation.

The results of the inquiries of physiologists as regards the food of vegetables, have not been so well defined and satisfactory. As the sap of plants is a fluid, and transparent, we are sure that complete solution is essential as a preliminary, and that nothing enters the spongioles of the roots organic in its structure, a state of perfect solution being incompatible with such structure. The principle part of the sap is water; in it are dissolved carbonic acid, phosphate of lime, carbonate of lime, carbonate of potash, and, in very many instances, silica. And these inorganic substances, I apprehend, are to the plant for its food what the organic substances before mentioned are to the animal for the same purpose; and these are not less elementary than those as nutritive principles. The sap so impregnated, passes from the rootlets by ascending vessels to the leaves, undergoing some change in its passage, but a greater change in the leaves, where

carbonic acid is decomposed under the influence of light, oxygen evolved, and woody fibre either formed completely, or a substance formed about to become woody fibre, and to be deposited by the sap in its descent through another order of vessels. And as in the animal frame very different compounds are secreted by different glands, so, too, in the vegetable a vast variety of compounds are produced by an analogous function of secretion; tubes and cells in the latter corresponding to glands in the former, the ultimate structure of which is also similar, the glands being congeries of tubes or cells.

Returning to the sap, it may be asked—and it is an important question—How are certain of the substances, which I have mentioned as essential to this nutritive fluid, dissolved in the water of the sap; such as phosphate of lime, carbonate of lime, silica, themselves insoluble in water? My belief is, and it is founded upon experiments which I have made, that their solution is effected by the carbonic acid in the sap. It is well known how soluble carbonate of lime, and, I may add, carbonate of magnesia, are in water containing carbonic acid; it is quite certain that phosphate of lime is also soluble in the same, and that not in an inconsiderable degree; and the experiments which I have made on silica to me are convincing that it likewise is soluble in water impregnated with carbonic acid, though in a degree very much less than phosphate of lime.

Taking this for granted, a certain simplicity is imparted to the theory of the nutritive process of plants. A fluid medium, water, holding a gaseous acid, carbonic acid, is the menstruum of the inorganic substances derived from the soil which the plant requires for its growth. This compound solution becomes exposed in the leaves to the action of light, and to the evaporating agency of the wind; the carbonic acid undergoes decomposition as a ready mentioned, carbon being detained for the use of the plant, oxygen being exhaled; a portion of the water is removed by evaporation, and, in consequence, the solvent power of the menstruum is diminished and depositions of silica and carbonate of lime and other ingredients take place. This view, it appears to me, is not only recommended by its simplicity, but also by a certain beauty and exactness of adjustment and economy of means. Is it not very admirable that a gaseous acid, which with water, is to yield to the plant, by decomposition, its organic elements, should be the solvent and vehicle of its inorganic parts?

The talented writer of these Lectures on Chemistry, &c., concludes his remarks on this subject by noticing the fertilizing means derived from the atmosphere, and animal, vegetable, mineral, or inorganic matters.

Report of the Agriculture of the County of Lancaster, with observations on the means of its improvement; being a practical detail of the peculiarities of the county, and their advantages or disadvantages duly considered. By WILLIAM ROTHWELL, Winwick. London: Groombridge & Sons.

We have great pleasure in drawing the attention of our readers to this work. Mr. Rothwell has for many years been a supporter and contributor to this journal; and although we have not the pleasure of his personal acquaintance, he is well known to us as one of the best practical agriculturists in this part of the kingdom. This will be at once apparent to all who have the advantage of reading his book. Practical utility is stamped upon every page of it, which contains his own views on any practical point; take, for example his observations, "*On Ploughing*:"—

In ploughing old grass for oats, the *depth* of the furrow must be two-thirds of the breadth, or the work will not be good. If less, the furrows will lie too flat; if more, they will stand too much on their edge, and there will be a great loss of seed. Some farmers are in favour of ploughing only four inches deep, as by this, a greater number of rows of corn will be grown in a given breadth than with deep ploughing, and of course, broader furrows. I should never, in any case, recommend less than six inches, but, of the two, should prefer eight inches deep. In this case, the furrows would be twelve inches broad, and of course, have only half the number of rows of corn upon a ridge, as he who ploughs only four inches deep. Old lea ploughed four inches deep, cannot produce much loose mould in harrowing, and what there is, is full of grass roots, and requires double the time for harrowing and ploughing, to that ploughed eight inches deep. The deeper old lea is ploughed, and the easier it is harrowed, the better the seed will be covered, and a less quantity will answer; there is also less risk of the grub and of drought, and more loose mould for the crop to grow in. It is not the greatest number of rows of corn in a field which produces the best crop, but where the plants are most vigorous, and clearest from the grass or weeds. To plough deep, in old lea, is quite as easy for the horses as shallow ploughing, because the ploughshare goes below the grass roots in the former case. The best crop of drilled wheat I ever saw, was drilled at twelve inches.

In ploughing old lea, in the autumn, intended for potatoes or turnips the following season, the common practice of ploughing as shallow as possible is quite right; but in this case, I should give the land another ploughing very deep, before the winter sets in, unless I intended to delve the land with the spade, and put the turf below.

When the ridges are very high and broad, in old lea, and a crop of oats is intended to be taken,

the best way is to plough it into half ridges, as it is impossible to raise the ridges sufficiently by the common method of ploughing crown and furrow. This is common in Scotland upon stiff soils. The land is easier to plough, the water can get better off the land, and the crop will be better. In ploughing the land on this plan, the ploughman takes his first furrow on each side the ridge to the full depth, and eighteen inches from the side of the old furrows or reins. They will thus fall over to the side of the old furrows, but not into them.

Mr. Smith, of Deanston, recommends all land to be cultivated flat without open furrows; or with as few as possible, when it is thoroughly drained. But if he had farmed a stiff clay soil in Lancashire for twenty years, and paid a rent for it, he would not, I am satisfied, have done so, however well the land had been drained. I have drained clay land quite as well as ever he did, but still it would not be cultivated on the flat. It may do on light soils anywhere, and also on heavy ones, perhaps, in the eastern counties of England and Scotland, and also in the south of England, where far less rain falls, than in the western countries.

2nd.—Fallowing. All suitable land intended for potatoes, turnips, beet, cabbage, beans or plain summer fallow, should have a clean deep ploughing after harvest, and left in ridges all winter.

In the Spring, let the ridges be well harrowed, and ploughed down by another clean deep ploughing, taking care that the ploughman never takes a furrow so wide, but that *every inch of soil be turned over to one uniform depth*. After this, with care never to go upon the land when out of condition as to moisture, no more ploughing will be required in preparing the land for the crop, if a proper use be made of the cultivator, the roller, and the harrow.

For a plain summer fallow, another ploughing or two will be necessary. One clean deep ploughing in dry weather is worth three bad ones in any weather. In all cases of fallowing, without the eye of the master, an unprincipled or careless ploughman will pay more attention to what is called "*blackening*" the land, than doing the work well, and will appear to have done a good day's work when it is not half done; and I am sorry to say that too many farmers pay more attention to the "*blackening*" system, than to real utility.

And also his remarks "*On Stall Feeding, or Soiling*," as it is called in the northern counties, from which we make the following extract:—

Stall feeders say, that stock kept in the stall, will, *feed faster, and milk better*, than when a pasture; this will depend upon circumstances. In *hot, or cold and rainy weather*, this is true; but in *mild, temperate weather*, it is not true, if other circumstances are the same. And here again the stall feeders, or rather I should say, the crists

do not state things fairly. If a cow be kept on clover in the stall a week, and then on pasture a week, to try the difference in her produce, she ought to pasture in clover, and not on a piece of poor pasture; and, in this case, the experiment would not be fair, except the weather was the same in both cases. For cattle to run out of doors in the winter season is folly, to say the least of it, if the land be clay, clay loam, or a black soil. If the pasture be dry and sandy, there can be no harm in the cattle going out a little in the middle of the day. Cattle turned upon strong land in the winter, is of no use to them, and they do injury to it for the succeeding summer.

By soiling stock in summer, a far greater heap of manure is made in the course of the year. This is considered by soilers to be one of their great guns in argument, and yet it is the weakest, or one of the weakest arguments they make use of. It is quite true, a far greater quantity of manure is made by soiling stock, than by *pasturing it*; but then, *more is required*. If the produce be carted off a field to the farm yard, the manure made from that produce, together with the urine, must be carted on to that field again, or the field must be poorer than it was. If cattle pasture the produce to a field, both the dung and urine are left upon it, and the field remains in the same state of fertility, or poverty, in which it was before the pasturing commenced, unless the land be naturally very bad soil. Land which is a deep rich soil, will improve in richness by pasturing, but will never do so by mowing or ploughing, except the produce be returned to it in the shape of manure, solid and liquid. If a stall feeder purchase a great quantity of provender for his stock, he will enrich his farm more if all the manure and urine be applied to it, than if pastured and no provender given to the cattle. But in making a comparison, this would be unfair, except manure was purchased to put upon the land pastured. It is said, that manure and urine dropped upon the land by cattle pasturing, do little good: this is not true. Why do landowners tie their tenants to have a certain portion of their farms in pasture? Why, from the well known fact that pasturing land does not impoverish it. To manage pasture land in the best style, it should first be put in good condition, and made dry; it then requires a little care every year, to pull up any weeds which may grow in it, and keep the droppings properly spread. If a farmer be too careless or too indolent to do this he would be completely unfit for a stall feeder. He would make sad work in that system, for he would waste his cattle food, their dung and urine, and, consequently, the land and himself would soon be brought to poverty.

A careless or indolent man should never be a stall feeder. It may be asked, why are there so many poor pastures in this country? Because

they are made so by ploughing and mowing, before they are laid down to pasture.

Mr. Lawrence, a great writer on agriculture, in advocating this system, and in combating the argument that pasturing does not impoverish land, and that mowing does, asks this question. "Whether there be some charm in the mouth of a cow?" Now, if Mr. Lawrence had been a practical man, he would have known that the charm lay elsewhere. He would also have known that it is not mowing a field that makes it poor, but carting the produce off the field after it is mown. If the manure made from that produce be spread upon the field again, then the field is in the same state of fertility as before it was mown, or as it would have been if it had been pastured. It is quite clear that the extra quantity of manure made by soiling is required by the land, and of course no profit arises from that.

In pasturing *feeding stock*, they are driven to the field and remain there till fat. They feed themselves, and leave their manure and urine on the land. In this there is little expense. In stall feeding, the food has to be cut and carted from the field to the yard, and the dung carted back and spread upon the field. This, including the attendance of the cattle in feeding and cleaning them, in paying attention to the manure and urine, and in loading the manure, &c., is a considerable expense, which has to be paid for, from the profit of keeping more stock upon the same land.

In a *milk stock*, the difference of expense is not so great between pasturing and soiling, as in a feeding stock; because in pasturing a milk stock, they have to be driven from the field to the farm yard twice every day, and carry their milk home to the dairy. In either case the expense of labor will be about half the cost of carting the food to the cattle.

In a *feeding stock*, pasturing, there is no wear and tear of roads in driving stock twice a day to or from the field. In a milk stock there is, except they are milked in the field, and there is always great inconvenience in this.

In stall feeding stock, there is great wear and tear of roads in carting the manure to the field, and the food from it, particularly if the weather be wet; and in Lancashire we have too much of this sort of weather.

In pasturing strong loams, stiff clays, and peaty soils, in *wet weather*, great damage is done to the grass by treading; but there is also great damage done to this land in such weather, by carting the produce in a green state from it. In stall feeding, the food should be brought fresh cut to the cattle twice every day; therefore, the horse and cart will have to go twice upon the field every day, to the place where the food is cut. It will not do to carry it to the gate, and it would never do for a stall feeder, except he makes up his mind to raise good crops. Labor

seeds. &c., would eat up the value of light crops. I will suppose a good crop of clover to be carted home green to cattle; the weight will be ten or twelve tons upon a statute acre: this would make twenty or twenty-four journeys, perhaps, upon every acre, with a horse and cart; and if the stock soiled were few, the number of journeys would be greater. It will thus be clearly seen, that on the above description of land, in wet weather, the damage by carting must be great. Almost every writer on soiling overlooks this, and yet they can write on the damage done by pasturing such land in wet weather. We are not yet got to that perfection in the arts as to be able to remove our crops from the fields in balloons. In a few years, perhaps we shall be. "Agriculture," it is said, "is only yet in its infancy." It was so when I was a boy, fifty years ago.

One advantage of stall feeding is, that the cattle never get into mischief, if there be proper conveniences at home in the yards and stalls; and without these conveniences, the system will not answer. Another advantage is, there requires few fences upon a farm; of course the expense of keeping them in repair is done away with; the land they take up applied to better purposes; and that, for a couple of yards on each side of the removed fences, made of more value. But, will the landowners allow the fences and hedge row timber to be grubbed up? Game preserving and stall feeding will never do together. When the land is continually under the plough, as it must be under a proper system of stall feeding, except occasionally, when in clover, it will never do to have small fields and crooked fences.

If a farm be very large, it necessarily follows that some parts of the land will be a considerable distance from the farm yard, and will, of course, increase the expense of carting food and manure. A small farm will have the advantage over a large one in this respect.

Under a complete system of stall feeding, the horse and manual labor is very great; and to carry it out to the best advantage, the farm house and outbuildings should be convenient and extensive. They should be situated in the centre of the farm, whether in a large or small one, with good roads from the yard to every field or part of the farm. Whatever part falls short or this, adds to the expense of carrying on the system, and not for one year but every year. Where the soil is very thin, and the subsoil very bad, or where the surface of the land is very hilly, stall feeding, as a general system, never can or will pay the expense.

Two very great advantages of stall feeding are, the finding of more labor for the working classes, and raising more food for man from the same extent of land. These are two very great and important considerations. Every farmer, before he commences the system, must con-

sider his circumstances—the soil he has to work upon—the state it is in—the climate he has to contend with—the prejudice of his landlord as to ploughing up the old grass—and the number of game to be kept. I have no doubt, but as the population increases, stall feeding will, and must be extended. But before it can be extended very much to the advantage of farmers, there must be a reformation in landowners' opinions on many points; a reformation in the habits of farmers, in their general intelligence; and a complete reformation in farms and farm buildings.

Stall feeding requires the constant attention of the master. An attentive, humane, good tempered servant, who has the care of cattle, in any case is invaluable; but more particularly so in stall feeding, as the cattle are then always under his care. Great loss may arise from giving too much food at once, or from neglect in giving it in proper time. A hasty tempered man should never be intrusted with the management of cattle.

It will be seen, that weighing the advantages and disadvantages of the system, is a very difficult task, if we desire to come to a correct conclusion. I shall therefore conclude by giving my general opinion, leaving each one to calculate the odds for himself.

On small farms of from two to twenty-five or thirty statute acres, I have no doubt of its advantage, if the land be of fair quality, and not hilly; likewise dry, or can be made so. Upon a middle sized farm, if the land be good and dry, lies convenient to the farm buildings, not too hilly, and the stock kept, a milking one, I should say the advantages were in favour of stall feeding. If the soil was a stiff clay, or very hilly, or the farm very large, or lay very inconvenient I should not recommend stall feeding cattle at all, and particularly if a feeding stock. In every case, I should recommend work horses to be fed in the stall. To conclude, I would recommend no farmer, whether his farm be great or small, to adopt stall feeding, except he be industrious and preserving, having a full determination and the power to do full justice to the land and the stock.

HEREDITARY TENDENCY TO DISEASE. AND THE REPRODUCTION OF MALFORMATION IN THE PROGENY OF BREEDING ANIMALS.

BY MR J. M'GILLAVRAY, V. S., HUNTLY.

I have long been of opinion, that, in the breeding of young horses, farmers and others pay too little attention to the physical qualifications and general conformations of the animals they employ as parents. It is an *old*, a true, and well-known saying, that "like produces like;" and it requires only a careful observation of facts to be convinced of the correctness of this laconic

maxim. From circumstances that have forced themselves on my notice for some time back, I have been led to pay particular attention to the above branch of our rural economy. The circumstances to which I more immediately refer consist in uprightness of pastern occurring in foals, in consequence of which they walk too much on the toe or front part of the hoof. These parts are in the young animals extremely soft—they are soon worn off—the toe becomes too short; as a matter of course, this increases the evil; the foot is thus placed in a false position, as regards the limb and the animal. The coronet bone is pushed into the upper part of the hoof, which then projects over the lower part or toe; and very soon the little animal is fairly *knuckled* forward, and can neither stand nor walk but with extreme difficulty. A peculiar method of shoeing becomes necessary, so as to bring the foot again to its proper position, and save the beast from utter uselessness.

It being a fact that the evils alluded to have appeared among the progeny of a certain stallion and likewise a variety of mares, leaves little room to doubt but that the stallion is the cause; and we are of opinion that the cause is hereditary, and may be transmitted from sire to son. Indeed, it is natural to suppose that, if "the good qualities of the animals are communicable to their offspring so are bad." It is the proper study and application of these principles that constitutes the grand secret of improving the different breeds of animals. And not only may natural defects be communicated from one generation to another generation, but deformities the result of accidents are also communicable. In the endeavour to investigate the above subject abundant evidence has been found to warrant this conclusion.

A stallion named 'Dominie Samson,' who had run very successfully in this country, but was fired in both hocks for *curbs*, was purchased by the East India Company, and sent out as a covering stallion to the stud at Buxar, where, for five years, he had much about 40 foals annually; they were generally affected with *spasms* or *curbs*, so much so, that only one of his stock passed into the cavalry; and, consequently, he was discarded from the Company's stud."

A Major Hunter also records that he knew a stallion that had encysted tumours at the point of his elbows, and most of his stock were affected in the same manner.

"An Irish stallion, named 'Musician,' had very bad fore-legs, and none of his stock were strong in the fore extremities."

An accidental natural defect is often propagated from parents to their offspring and continues thus a peculiar breed. Mr Blaine mentions a singular breed of swine that did not *part* the hoof, but were what naturalists call *solidungular*, having feet resembling the feet of horses. There is also the *Ancon*, or otter breed of sheep,

described by Colonel Humphries, in the *Phil. Trans* for 1813, part 1. These sheep were derived from an American lamb, born with legs deformed and most disproportionately short to the rest of his body; the fore-legs were extremely crooked, which, added to their shortness, rendered him unable to run or break fences. With these qualities it was determined to attempt a breed of this kind; and, by confining the intercourse between him and his future offspring, it succeeded, and the *Ancon* or otter breed is now established.

In the records of the transactions of the Linnæan Society of London, is found an account, by Mr Milne, of a pregnant cat, his own property, the end of whose tail was trodden on with so much violence as appeared to give the animal intense pain. When she kittened, five young ones appeared, perfect in every other respect except the tail, which was, in each one of them, distorted near the end, and enlarged into a cartilaginous knob. In this case it is probable the tail of the animal had been so much bruised as to stop the circulation; the vessels would become enlarged at the ends, and Nature, true to the principle that "like produces like," produced kittens with the deformity alluded to. Mr Blaine also mentions his having seen a breed of tailless cats, the offspring of one accidentally born without a tail.

The above facts show the importance of paying proper attention to every thing connected with the animals intended for breeding, more especially the male. The female being the property of the owner, with all her defects he is likely to be well acquainted; not so the stallion; he often comes from a distance, little of his history or character can be accurately ascertained, and, therefore, his physical conformation ought to be made the subject of severe scrutiny.

During the season that is now past, I have required to get a good many foals shod in consequence of the fault mentioned at the beginning of this paper. And, as the form of shoe I have adopted is peculiar, and, so far as I have been able to ascertain, has proved effectual in removing the evil, should any of the readers of this Journal have occasion for such an operation, I shall be glad to furnish him with the necessary information regarding the construction of the shoe, &c., on application.

LEGAL WOOL GATHERING.—Lord John Russell took the greatest pains to prevail upon Lord Langdale to resign the permanent Mastership of the Rolls, and accept the unstable position of Lord Chancellor. The Premier paid very high compliments to the talent and learning of Lord Langdale, who only requested Lord John to desist from flattering, inasmuch as "so long as he, Lord Langdale, enjoyed the Rolls, he cared little for the butter."—*Punch*.

MOUNTAIN STREAMS.

(An Inspiration from Town.)

BY CHARLES MACKAY.

What time the fern puts forth its rings
What time the early throstle sings,
I love to fly the murky town,
And tread the moorlands, bare and brown ;
From greenest level of the glens
To barest summit of the bens,
To trace the torrents where they flow,
Serene or brawling, fierce or slow ;
So linger pleased and loiter long.
A silent listener to their song.

Farewell, ye streets. Again I'll sit
On crags to watch the shadows flit ;
To list the buzzing of the bee,
Or branches waving like a sea ;
To hear far off the cuckoo's note,
Or lark's clear carol high aloft,
And find a joy in every sound,
Of air, the water, or the ground ;
Of fancies full, though fixing naught,
And thinking—heedless of my thought.

Farewell ! and in the teeth of care,
I'll breathe the buxom mountain air,
Feed vision upon dykes and hues,
That from the hill top interfuse,
White rocks, and lichens born of spray,
Dark heather tufts, and mosses gray,
Green grass, blue sky, and boulders brown,
With amber waters glistening down,
And early flowers, blue, white, and pink,
That fringe with beauty all the brink.

Farewell ye streets ! Beneath an arch
Of drooping birch or feathery larch,
Or mountain birch that o'er it bends,
I'll watch some streamlet as it wends ;
Some brook whose tune its course betrays,
Whose verdure dogs its hidden ways—
Verdure of trees and bloom of flowers,
And music fresher than the showers,
Soft dripping where the tendrils twine ;
And all its beauty shall be mine,

Ay, mine to bring me joy and health,
And endless stores of mental wealth—
Wealth ever given to hearts that warm,
To loveliness of sound or form,
And that can see in Nature's face,
A hope, a beauty, and a grace—
That in the city or the woods,
In thoroughfares or solitudes,
Can live their life at Nature's call,
Despising nothing, loving all.

Friend,—one who will tell you your faults in prosperity, and assist you with his hands and heart in adversity.

RECOGNITION OF VOICE BETWEEN THE EWE AND THE LAMB.—The acuteness of the sheep's ear surpasses all things in nature that I know of. A ewe will distinguish her own lamb's bleat among a thousand all braying at the time, and making noise a thousand times louder than the singing of psalms at a Cameronian sacrament in the fields where thousands are congregated, and that is no joke neither. Besides the distinction of voice is perfectly reciprocal between the ewe and the lamb, who, amid the deafening sound, run to meet one another. There are few things that ever amused me more than a sheep-shearing, and then the sport continues the whole day. We put the flock into a fold, set out all the lambs to the hill, and then set out the ewes to them as they are shorn. The moment that a lamb hears its dam's voice it rushes from the crowd to meet her, but instead of finding the rough, well clad, comfortable mamma, which it left an hour, or a few hours ago, it meets a poor naked shrivelling—a most deplorable-looking creature. It wheels about and uttering a loud tremulous bleat of perfect despair, flies from the frightful vision. The mother's voice arrests his flight—it returns—flies, and returns again, generally for ten or a dozen times before the reconciliation is fairly made up.—*The Et-trick Shepherd.*

PURIFICATION OF DWELLINGS.—Last October I addressed a letter to the Board of Health—when the plan of house visitation was in full operation—with a suggestion that a cesspool visitation might be attended with much benefit. The connection between the cholera and the accumulation of those impurities which daily ought to be removed has been so amply demonstrated that we need bring forward no additional proof thereof. I beg then to recommend to the public that, during the approaching Summer and Autumn, particular attention be paid to the daily cleansing of these most attractive sources of the cholera poison. The disinfection of these places all throughout the densely inhabited metropolis can be efficiently secured by the weekly application of chloride of lime and white washing. This may be accomplished at a very trifling expense indeed, and now is the time to put in active execution all the subordinate means we have at command to mitigate the severity of epidemic disease. The intrinsic nature of cholera it would be out of place to inquire into here, but its immediate relation with all organic decomposing impurities is contested by none. That the principle should be successful, it should be carried on throughout every street, close, lane, and alley simultaneously ; and as it is likely it will be some time ere an efficient system of sewerage can be put in active practice, this temporary expedient cannot, I think, with safety be neglected.—*The Builder.*

Agricultural Journal

AND
TRANSACTIONS

OF THE
LOWER CANADA AGRICULTURAL SOCIETY.

MONTREAL, AUGUST, 1850.

COUNTY AND OTHER AGRICULTURAL SOCIETIES.

There is no way by which these Societies can produce more benefit to Agriculture than by offering and giving premiums for well managed farms, under proper regulations. We conceive that this would be the most certain mode of producing improvement, not in a few acres of crop, while all the rest of the farm was neglected, or not in a few animals, when the stock in general were not judiciously selected or well managed, but the premiums for well managed farms would take in the general management of the farm including stock, crops, &c.; and this is the best mode of encouragement to good farming in Lower Canada. We have seen premiums awarded for *chance* crops here, where the farmer had neglected altogether his other crops, and allowed the weeds to grow without any attempt to check or remove them. This we conceive, is a mis-application of the funds of Agricultural Societies. Well managed farms once obtaining the *first* prize, should be excluded from entering for competition again, and allow other parties to have a chance of prizes. It is not so easy to bring a farm into good condition certainly, but when once in good order, it is less difficult to keep it in that state, by observing a good system of rotation, and a due application of manure, and if there was no regulation that would prevent parties from obtaining the first prizes a second time, they might as well prohibit any competition. Every means should be adopted to prevent "prize catching"

and encourage general competition. We only refer to well managed farms, and to animals once receiving prizes. Good crops require attention every time they are produced, although they may be easier to produce on a well managed farm than on one that is not so, but still we see no objection to a farmer receiving premiums on good crops every year if they deserve it, and if all his farm is kept in good order. Premiums should not, however, be given for crops to parties obtaining premiums for well managed farms, nor should the same parties be allowed to compete for both. There is another matter connected with cattle shows, that appears to be very objectionable, that is, allowing the same parties to show more than one animal in the same class. Indeed to encourage more general competition, it would be well to restrict parties from receiving more than one premium for any species of animals,—one for horses,—one for neat cattle—one for sheep—and one for swine. We do not think it is conducive to Agricultural improvement to allow any party to "catch" too many premiums. It is only for the credit, and not actually for the pounds, shillings and pence, that any farmer should be anxious to be awarded premiums, because it is an absurdity to pay a man for doing or having, what is for his own advantage to do, and have. Agricultural Societies should be governed in all their proceedings, by a desire to produce the improvement of husbandry, where improvement was most required, and this is the only grounds that would justify, granting them aid from public funds. To encourage improvement rather than pay for it to those who already know the value and advantage of it, should be the object of Agricultural Societies. Well executed Summer fallows, the largest quantity of green crops, the best pastures, the best general state of drainage of a farm, the best and most economical fences—all these are objects that might be separately encouraged

by a lower class of prizes than would be paid for well managed farms. For well managed dairies premiums should also be offered, but of course competitors for well managed farms, could not compete for any of these separately. More general competition is what should be encouraged, and this would be sure to introduce more general improvements, when no parties would be awarded any premiums unless the general state of the farm was creditable in the estimation of the judges. This would prevent the awarding of premiums for merely chance crops, when the judges would have to go upon the ground and on the farm. We do not propose to disqualify a party from obtaining a premium for a good crop, because all his crops were not equally good. We only submit that a farmer should not be awarded a premium for any one crop while all the other crops, &c., appeared to be neglected and not managed judiciously. This regulation would cause every farmer to cut his weeds, at all events, before he could compete for any crop. For any District or Provincial Exhibition where premiums would be awarded for samples of grain, the samples should belong to the Society, to be sold or distributed by them for seed only, on certain conditions. By this regulation, the best seeds would be sure to be distributed in the country, and employed as seed. The premiums offered in this case should be sufficient to amply reward the party for giving up the samples exhibited, and if they were honest samples of larger quantities, as they should be, the exhibitors would suffer no injury, by losing the samples at a high price paid for them in the shape of premiums. In the same way we would propose to open District or Provincial Exhibitions to all competitors—native or foreign, for every description of farm implements, and award such premiums as would fairly reward the owners for those implements, but in all cases they should become the property of the Society, and might be

placed in a museum, and given out as Prizes by the Society at the next year's Exhibition. This would not be doing any injustice to the manufacturers of Implements who would sell so many at a fair price, for the premiums paid them, and they would have the further credit of having their names published as exhibiting the best Implements, which would be a very material advantage to them. A separate class of premiums might be offered to parties exhibiting Implements purchased and made use of by themselves on their own farms, whom it would not be just to deprive of them, but these premiums need not be of large amount. By thus opening the field of competition, we would obtain the best implements of other countries, if better than our own, which would be a great advantage. The duty upon articles coming from a foreign country for exhibition, might be easy to manage, by giving security at the Port of Entry, that for any articles that might be sold in Canada the duty would be paid. This is the course proposed to be adopted in England for foreign products coming to the great London Exhibition in 1851, and we may well follow so good an example. For any implements to which premiums may be awarded and would become the property of the Society, we would propose that the duty should be remitted, on the exhibitor showing a certificate of being awarded a premium. This plan would be a new feature in agricultural exhibitions, and we presume a useful one. The giving of approved implements as Prizes, we conceive, would be much a better plan than giving money, as those implements would be brought into use and into notice with other farmers. It would also, after the first year, be a great saving of the funds of the Societies, as they could award two Prizes for every one money premium actually paid, and this without doing injustice to any party, or giving any just cause of complaint. A fair price for

the implement as a premium to the manufacturer, and the credit of being awarded this premium, is a fair principle, and should be perfectly satisfactory. There are many other regulations that might be usefully introduced for the management of agricultural societies, which we shall submit occasionally.

AGRICULTURAL REPORT FOR JULY.

The month was exceedingly hot and dry up to the night of the 13th, when we had a most refreshing rain which continued 24 hours and produced great improvement in the crops, particularly root crops and grain that was sown late. We had occasionally showers the first few days of July, but they were not general, nor in sufficient quantity to soften the soil, parched by excessive heat and drought. The rain on the 14th came most seasonably to moisten the thirsty soil and growing crops, and we hope it may have a beneficial influence on the crops throughout the country. Rain, if not in excess, is very necessary to fill the grain in crops coming into ear—but long continued rain between the middle of July and middle of August, never fails to be injurious to all grain crops, except, perhaps, oats. We have had rain on St. Swithin's day, but we do not attach much consequence to that circumstance, except that when the weather changes at particular periods of the year, from wet to dry, or from dry to wet, it is very apt to continue so for some time, and the middle of July is one of these periods, and being the most critical period for the growing crops, it has attracted more the attention of agriculturists. We hope, however, that rain on St. Swithin's day this year, will not bring us unfavourable weather for forty days, as it would be a most serious evil indeed. We do not believe that the crop of hay is a heavy one generally, particularly on old meadows that are not very fertile. The month

of June was warm and dry, and we have never seen a very heavy crop of hay when this was the case. Heat and moisture in June will produce good crops of hay even on poor and old meadows. The rain on the 14th will increase the length of straw that would certainly have been generally short, only for this rain. The wheat has not generally come into ear before the 15th of July, except that which was early sown, and we are almost certain that we had not the fly for some days previous. We did not at any time this year see much of the wheat fly. We sowed some of the bearded wheat, heretofore grown in Canada, on the 20th of April, and on the same day, some of the Black-sea-wheat, in the same field, and were surprised to find the former wheat in ear before the latter, or three months wheat. We cannot say, however, which will come first to maturity. It is probable that wheat will not suffer this year by the fly; so far there is no appearance of injury, even to fall wheat that came into ear before the end of June, the most dangerous time for the fly. It would indeed be a great advantage to this country if this insect would leave us, that has caused so great loss to the people. Experiments have been made this year by early and late sowing that will show whether we can venture upon early sowing in future. We have examined wheat sown at various times from the 20th April to 20th May, and perceive that there are scarcely any larvæ of the fly in the ear. The early sown old Canadian wheat is decidedly the best and fullest grain up to the present moment and is likely to continue so. To sow clean samples of unmixed varieties of wheat, would be very desirable, and there is a considerable loss incurred when this is not carefully attended to. When seeds of weeds are sown they grow in the crop, and when mixed varieties of grains are sown, they do not mature properly together, and never make a good sample.

Wheat should be cut before it is perfectly ripe, or there will be a risk of losing some of it before it is housed. In land that is properly prepared for a wheat crop there should not be much grass or weeds produced with it, and in that case, when the crop is clean, the best way to manage it when cut is to bind it up in small sheaves, and stook it in the field, placing ten or twelve sheaves standing together and covering these with two sheaves on the top. They may remain in these stooks, until fit to house or stack. When the crop is not clean, and is mixed with grass and weeds, there is no better way to manage it than the Canadian plan, of allowing it to wither and dry before it is gathered. This is certainly a slovenly plan of managing wheat and other grain, and a very objectionable one in a wet or changeable harvest, but where the crop is not free from weeds, there is no better way of drying both grain and weeds, and it is the least expensive way of managing crops that are not very heavy. For a good clean crop of wheat, barley, or oats, there is, however, no better and safer mode of management, than the English mode, of gathering and binding, as it is cut down, and making it up into stooks in the field. In Ireland, and frequently in Britain, when the harvest is not dry and fine, they stack the wheat when cut and bound, into small stacks, placing the first sheaves nearly standing to save the grain from the ground, and then making the stacks the width of the length of two sheaves meeting in the centre. They are generally made by men standing on the ground, and placing the sheaves round with the grain inward until sufficiently high to bring the stack to a point, and it is then covered by fixing two or three sheaves with the ears downwards as a cap to the stack, and tied there with a rope of hay or straw. The grain is preserved in these stacks, and will dry and season very soon for the barn or stack yard. Of course, these stacks should

not be left too long in the field, but should be carted as soon as the wheat is seasoned and dry. In the old country, we always secured our wheat in this way, and found it to answer well in the changeable climate of the British Isles.

Canadian farmers suppose that allowing the grain to remain upon the ground for some time after it is cut, improves it, and makes it easier to thrash. No doubt of this, and in dry seasons, there is no objection to their plan; but when the season is changeable, and in any case that the crop is clean, and heavy, we think the better way would be to bind up the crop in small sheaves, when cut, and stook or stack it immediately. Indeed, when made properly in small stacks, by persons who know how to make them, there is no way by which wheat can be better seasoned and preserved. In case of high wind and rain, a field of wheat in stooks, is apt to be very much injured, and sometimes the sheaves never get properly dry until opened out. We submit these suggestions for the consideration of the farmer. Small stacks must be carefully and neatly made by persons who understand doing this work, and if they are, there is no doubt but the wheat will dry and season. We know that in dry seasons, both barley and oats are frequently mown down, and left upon the ground until dried, and then gathered and carted like hay. We do not object to this plan under certain circumstances, as a great saving of labour, but it is certainly a dangerous plan, should bad weather come upon it in this state. When the crop is poor and thin it may answer, but we should not have poor and thin crops. None except average crops are worth the labour, and we would do much better to allow the land to rest, or summer fallow it, than to sow land not fit to produce an average crop. Now would be a good time to sow seed for ploughing in, as green manure. Where there is summer fallow it

might be sown now, with rape seed, with buck-wheat, or with white mustard, (not the black), and before the end of October, there might be a considerable crop to plough in; severe frost might certainly hurt any of these crops, but perhaps they might be ploughed in before there would be any frost that would hurt. At all events, the price of the seed would not be much, and although frost might do some injury, the land would be sure to be improved by a young crop of any of these species ploughed in before the winter. The seed should be sown thick so as to have the ground well covered with the young plants to plough in as manure. It is greatly to be regretted that when our lands might in the summer season be producing something for their own improvement we do not assist them to do this. A crop that would be sown now as we propose, would attract a great part of the nutriment necessary for its growth from the atmosphere, and thus we would take from the atmosphere a portion of manure to improve our lands. Rape, buck-wheat, and white mustard, are plants that grow rapidly, are soft, and have a considerable quantity of leaves, and consequently draw a great part of their nutriment from the surrounding atmosphere. By adopting this plan, we arrest, as it were, the fertilizing qualities suspended in the atmosphere and bring them in our soil, to produce future crops. This is not theory but a certain fact. Any plants of large leaves and rapid growth, will always draw their chief nutriment from the atmosphere, and from heat and moisture. Lands are capable of great improvement by simply draining them sufficiently, ploughing them properly, and keeping a good proportion of every farm in good pasture and meadow. It is, however, contrary to all good farming to support the cattle and sheep on the straw, instead of putting the straw into manure for the land. Except on farms that have the hay produced

upon them sent to market, we believe that most farms might produce sufficient manure to keep them in good fertility, provided a rotation of crops was observed, and a due proportion of the land cultivated for green crops or summer fallow every year. Unless there is something like a regular system of agriculture observed, it would be absurd to expect good or profitable crops. How is it at present—the straw is nearly all eaten by the cattle—the manure is consequently in very small quantity, and that not applied in the most judicious manner—the grain is sold or consumed by the family, and how then, we would ask, is the fertility of the soil to be kept up? No soil can be maintained good if always producing, and receiving nothing in return. We have been told that in some parts of the country the wheat plant has been injured by the wireworm and slugs. The wireworm is a most destructive insect to the roots of any grain crop that it attacks here, as well as in the British Isles. Heavy rolling, or the application of soda ash at the rate of 100 lbs to the acre, is found to be the best remedies. We do not know to what extent this injury has been inflicted. We have also heard complaints of crops of wheat standing very thin, and this we suppose to arise from the soil not being in a very fit state when sown. In many cases it was too wet, and in others, the seed being sown late, and in very dry weather, much of the seed did not grow.

The rains we had from the 14th to the 20th has injured any hay that was cut and in the field, but the hay harvest was not generally commenced before the 22nd. We do not believe that the rain was injurious to any other crop, but on the contrary, it was beneficial to all crops and to pastures. There is a good supply of butcher's meat this year, and prices moderate. The butter market is also well supplied, and prices not high. Oats brings a fair price, 2s. the minot, and peas from 3s. to 3s. 6d.

At the present moment with, we hope, very little injury done to the wheat crop by the fly, there is every prospect that the crops will be a fair average in proportion as skill and industry have been employed in their cultivation and management. We cannot expect that crops will be very heavy, and good, if the farmer has not done all that was possible for him to do to make them so. Land, however good, and seasons, however favourable, will not produce good crops, if the lands are not properly cultivated for them. It is the farmer's duty to do all that he can to be prepared for all contingencies for favourable as well as unfavourable seasons. It is by the exercise of skill and industry that good crops may be raised, even in seasons that are not the most favourable for them, and this is one of the many advantages of skill and industry.

25th July, 1850.

In the July number of the Agricultural Journal we submitted several questions in reference to the state of Agriculture in Lower Canada, in the hope they might be answered by parties taking an interest in the subject. We shall make a commencement by replying to a few of these questions according to our view of the subject. We believe that the true state of Agriculture will be better ascertained by answers to these questions, than by any *general* opinions that might be offered by parties, however, well qualified they might be on the subject. By answering the questions correctly, a just conclusion may become to as to state of our agriculture, and the improvements that are necessary to be introduced will be perfectly manifest. This, we conceive, would be a better mode of proceeding than to act upon any general opinions that might be offered. If we can see clearly the system of husbandry that is generally practised, there can be no difficulty of understanding its defects, and

the necessary improvements to be introduced to remedy these defects.

The first, and four following questions, we cannot reply to with any pretensions to accuracy, and will leave them to other parties to answer.

The 6th as to the state of drainage generally, we can reply, that we have never seen a farm drained in Canada, to come up to our ideas of what was necessary. Even as regards open drains, they are not generally well formed or sufficiently deep to carry away the water with the necessary rapidity from the lesser drains, and this is a matter of great consequence that the water should discharge rapidly from the lands. The country is generally level, and unless the main drains are considerably lower or deeper than the lesser drains, the discharge of water will be too slow from the lands, and hence they become saturated with moisture until dried up by the sun, and it is from this cause that the soil becomes baked and hard. We feel persuaded that improvement in draining so as to make it sufficient to dry the land, would double their *annual* produce. Lands insufficiently drained cannot be cultivated properly, or to advantage, for any crop. Drainage is more necessary here than in England. We know some parties entertain a different opinion, because there is so much heat and drought in Summer here, it is, however, a great mistake to suppose that the stagnant water remaining in the soil would be beneficial to the crops in dry and warm Summers. Any farmer may be convinced of this by examining the crops upon the insufficiently drained parts of his lands, and comparing them with the well drained parts in the driest Summers we have. The latter will have a good crop, while the former will have scarcely any crop upon it. There is another defect in our drainage, that in general the drains are cut perpendicularly and the earth taken out is heaped upon the bank of the drain. Hence the parts of the

lands nearest the drains are much the highest instead of being the lowest, as they always should be. The drains from not being properly sloped are continually falling in from the effects of rain and frost, and hence in the Spring, when the action of the drains is most required, they may be nearly useless from the earth of the sides falling into them. The high banks or mounds formed upon the edges of the drains are undermined by the water in its passage to the drains, and cause the soil to close in at the bottom of the drains or to waste in from the sides. All drains should be very much sloped, and always in proportion to their depth, allowing that for every foot in depth, they should be two in width at the top, and any drain under four feet deep, requires to be only the width of a shovel at the bottom. When a large quantity of water has to be discharged, and the drains are large and deep, the bottom may be wider; but in very few cases does it require that the bottom should be over from 12 to 18 inches wide. A well sloped drain takes away the water better than one that has the sides nearly perpendicular. Every particle of earth taken out of drains in making or sloping may be applied to useful purposes as compost, for filling up low places, and as dressing on soils of different qualities, which latter application might be better than manure for it. It would be a great improvement to remove all the banks of drains, and would pay well for the trouble. In all cross drains in farms it would be well to slope the drains so that the plough might pass over them, unless where water was constantly running. Made in that way it would be easy to keep them in good order by a simple channel in the centre, kept clean, the width of the shovel. The grass might grow upon all the slopes except this small channel. When a large quantity of water was to be carried off, the drains being wide would admit of its rapid discharge, and subsequently the small chan-

nel in the centre would be sufficient, and no other part would be waste. The first expenditure in constructing drains properly, might exceed the cost of making drains in the usual manner, but this extra expense would be amply repaid, by the saving of expense in keeping the drains in order subsequently. The banks of drains, as generally made at present, are much higher than the lands adjoining instead of being lower, as they should be. There are many small rivers and water courses that would require to have obstructions removed, that dam the water and cause great injury to the lands through which they pass. We have seen many of these where a trifling expenditure would remove the obstructions, but as several parties would derive benefit from the improvement, it is altogether neglected, because all parties do not unite to execute the work required to be done. In England the Legislature have made large loans to landed proprietors for drainage and other improvements, and are doing so this Session of the British Parliament, and these loans are made on very favourable terms. These loans are made in a country where there is a great amount of capital already employed in Agriculture. Some of the best lands in Canada are waste for want of draining. Clay lands in particular that require draining, would produce immense crops if drained. Cultivation and manure is all but wasted when employed on undrained land, and we are convinced there are not many farms in Canada sufficiently drained throughout. We have been more particular on this subject, as draining should precede all attempts to improve our Agriculture in this country.

No. 7 we shall not answer, but leave it to other parties.

No. 8, usual course of cropping, and modes of cultivation and manuring for each? we may make some reply to, but not so fully as would be necessary.

The practice most general in Lower Canada amongst Canadian farmers is to have the farm divided nearly in two equal divisions, and sow one half one year, and the other half the next year, without sowing any grass seeds on the half left for pasture for one year. The manure from the farm yard is frequently put out on a small portion of the pasture in the month of July, and left in cart loads unspread, until the fall ploughing when it is spread and ploughed in. We have often seen as much manure put out in this way upon an arpent or two as would be a reasonable dressing if properly applied, for ten arpents, or more, while these ten arpents are left without any although requiring it as much as that which had so much over what was necessary. The manure upon a large portion of farms is thus nearly wasted. It loses while in the yard, a large portion of its valuable properties, and is then put out to the field to be exposed in cart load heaps, to the hot sun at the most warm and drying season of the year. It thus must lose three fourths of its value before it is employed in the production of crops. The land that has been thus left for pasture is generally ploughed once in the Fall for sowing in the following Spring with wheat, peas, oats, &c. The ploughing may be executed so as to turn over the soil, but is seldom ploughed according to the established rules of good ploughing, as regards the width and depth of the furrow slice, and the proportion they should bear to each other. The ridges are not straight, nor the furrows properly finished and cleaned out for the water to run off. The bottom of the furrows should always be lower than the ploughed soil of the ridges in order to carry off the water from the ridges that would otherwise lodge under the furrow slices which form the ridges. By passing the plough once in each furrow, after all the land is turned over, a deep furrow would be formed which would completely drain the ridges if there are proper outlets,

provided to command the furrows. The want of attention to these matters is a great defect in Canadian ploughing, and the cause of the lands being so saturated with moisture at the Spring sowing time. These defects are easy to remedy, if farmers would take time to do the work. It is not a defect of a doubtful character, but one that must be plain to any man who will examine ploughed lands. If the bottom of the furrows are not *decidedly* below the under sides of the furrow slices, that form the ridges, it will be impossible for the water to pass off from the ridges, but it will remain under the furrow slices, to the great damage of the soil, and whatever crop sown upon it. We admit that good crops are frequently raised by this defective system but certainly only where the soil is of the very best quality, and where it would give still better crops, if cultivated properly. There is no such thing as a regular rotation of crops observed that is so necessary in good farming. The land is allowed to repose every alternate year, and cropped every alternate year by the simple preparation of one ploughing and harrowing in the seed in the Spring. If this system was practised in the British Isles, they would not raise crops of one fifth the value of those that are raised in these countries, under a better system of husbandry. Parties may think that improved systems of Agriculture would be unsuitable for Lower Canada, but there is no doubt that many improvements are required in our system of husbandry that might be introduced with advantage to farmers and to the country generally.

9th. Weeding the crops, &c.

We reply to this that weeding the crops is very much neglected generally, and that weeds prevail very injuriously in consequence of defective cultivation, the total neglect of rotation of crops, the small proportion of green crops, and the want of Summer fallowing to clean the soil properly. Thistles,

Wild-mustard, the Ox-eye-daisy, Wild-pea, Wild-oats and Mugwort are amongst the most prevailing and troublesome weeds, but there are many other very injurious. Couch-grass is very general and scarcely any exertion made to remove or destroy it, consequently it is to be seen in almost every crop, and in the hay crop when the land is seeded down. It is almost impossible to get rid of this grass, except by Summer fallow properly executed, when all the roots of this grass are harrowed up and hand-picked off the land. A large proportion of the nutriment of the soil is absorbed by worthless weeds in Lower Canada, and there is no effectual means adopted to check or remove them, on the contrary our system of husbandry tends to augment their number every year, and make them more injurious to the farmer. When weeds are allowed to mature, their seeds are sure to find their way to the fields in the manure, mixed with the seeds sown by the farmer, or fallen from the plants where they have grown in the lands.

No 11. Pastures.

The pastures are generally poor, compared with those of the British Isles, and with what they might be here. We have seen some excellent pastures in Lower Canada where justice has been done to them. It is a great mistake to lay down land in an exhausted state, and without any grass seed or clover for pasture. It cannot produce good pasture for animals, particularly when it is again ploughed up before it is covered with a natural herbage of grasses, or has time to be enriched by the manure of the cattle pastured upon it. If lands were allowed to remain in grass several years, they would become good pastures, although they might have been laid down exhausted and without clover or other grass seeds. By keeping the weeds checked, lands would soon become stocked with natural grasses, and make great improvement as pastures. The roots of

grasses that would be found in a pasture well stocked with them, would be a great means of manure when ploughed up for a cultivated crop. New pastures, unless laid down properly, and in a state of fertility have not fattening qualities, and will not be very productive in butter or cheese. In England, they frequently top dress the pastures where dairy cows are kept, supposing that cows giving milk, butter, and cheese, must withdraw from the pastures more nutriment than the manure of the cows returns to the soil, and we believe they are correct in this opinion. Pastures instead of being neglected as with us, should be a matter of great importance to us, to have them as good as they could be made, and then our cattle and sheep might be improved to the uttermost, and our farms would be altogether more valuable.

We are very sorry that the Legislature have not introduced some measures this Session for the establishment of "Associations of Agricultural Credit," or for authorizing their establishment. The new Banking Bill now before Parliament, should it become law, will not be likely to give much direct relief of agriculture. No doubt if we had many Banks, we should have more capital in circulation, but we cannot see that the Bill in question is likely to bring capital into circulation that would be much direct benefit to farmers. The plan we have submitted is, we humbly conceive, the one that would be suitable and beneficial for agriculturists, and to refuse them the privilege to provide capital from their own property, is not the way to advance their interest or afford them the means of improvement or prosperity. There is no doubt that agriculturists have ample security for the establishment of "Associations of Agricultural Credit," and while the authority for their establishment is withheld, it would appear, as if jus-

tice was not done to them, or to their interests. We should be glad to hear the objections advanced against these Associations, if there are any sound ones possible. We should then be better able to meet these objections. Until, however, these Associations can be clearly proved to be objectionable, and unsafe for the country, we shall continue to urge the right of agriculturists to have the privilege to establish them. Their establishment could not be unjust towards any class or party in the country, and it would be only granting agriculturists the same advantages that have been possessed by other classes long ago. We may not be able to discover all the advantages that the new Banking Law is to offer to farmers, but as we have given much thought to the plan we have submitted, we understand it better, and suppose that "Associations of Agricultural Credit," would be more suitable for them, and better calculated to promote their interests. It is well understood that Banking accommodation, unless in the way of "Cash Credits," as in Scotland, or by way of "Associations of Agricultural Credit," as in several countries in Europe, is the only means of accommodation that would be suitable for farmers, whose returns are slow, and generally annual. We would not propose that any farmer should obtain large loans, but only moderate assistance to enable him to improve and work his farm to more advantage, and the principle of these associations would be to see that any farmer obtaining accommodation should apply it judiciously, and make his annual payment regularly. These annual payments would be such a moderate per centage upon the loan granted, that no farmer who was industrious, and employed the loan judiciously, could have any difficulty in making the payments regularly: and not having any large amount to pay at once, there would not be any ill consequences to be apprehended. It

is quite a different affair from what is known as "Building Societies." Parties may have borrowed money to build houses in the hope that the rents of these houses would enable them to meet the payments to the Building Societies. This expectation at best, is a dangerous uncertainty, and has caused the ruin of many who had borrowed from Building Societies. It would not be so with agriculturists. Capital obtained by them in moderate amount, and employed in draining or improved cultivation, would yield a sure return that would enable them to meet the annual payments to the Association. A small amount to a farmer who would employ it judiciously, would in many cases, enable him to increase his productions the first year to the full extent of the amount borrowed. We have seen many instances when ten pounds laid out properly in draining alone, might have doubled the annual produce of the farm. This matter is one of vast importance to the whole Province, and deserves the most serious consideration.

The new School Bill for Lower Canada, will, we hope, contain some provisions for Agricultural Education. It appears quite unreasonable that this provision should not have been long since made. It may be very well to follow precedents in many cases, but we do not see any reason why we should not make precedents for others, as well as follow them. Can there exist any question that our Youth would be more benefited by reading suitable books on the theory and practice of agriculture, than any other description of books usually found in our country schools? There is much entertainment, as well as useful instruction to be found in agricultural books, and it is doing a great injustice to the most noble, most delightful, most useful, and necessary of all employments, to withhold books connected with this employment from the children of the rural population, while every other trashy work is forced upon their notice and study. We do

not object to necessary books for the study and instruction of youth, to give them a knowledge of the world and of mankind; but let them also have agricultural books to read and study—to give them some idea of—and attachment to their own profession. What are the objections to this course? Would it be likely to make the children of the rural population worse members of society, or less fit for the occupation of farmers? Why should these books, and this system of education have been excluded from our country schools up to this period? Without hesitation we answer, that this extraordinary system of teaching and training, for any thing, or every thing, but the business which they are to be employed in for life, has been a great bar to agricultural improvement, and has been productive of much injury to the rural population. Agriculture requires and is entitled, to as much training and instruction, by books, and by practice, as any other business or profession, and it is from the neglect with which it has been treated in this respect, that it is so little valued, and reading and study for it not considered necessary. Let agriculture and agriculturists have fair play in future, and we shall not long have to lament its backward state, but on the contrary, rejoice at its prosperous condition.

We have received a letter from the Secretary of the Agricultural Association of Upper Canada, George Buckland, Esq., inviting at the request of the Directors of that Association, the attendance of the President and other officers of the Lower Canada Agricultural Society, at the Annual Exhibition to take place at the Town of Niagara on the 18th, 19th and 20th of September next, and shall submit this letter to the next Quarterly Meeting of the Directors of the Lower Canada Agricultural Society to take place on Friday the 23rd of August instant.

We humbly conceive it would be most desirable, that frequent communication and friend-

ly relations should be maintained between the two great Agricultural Societies of the United Province, as the best means of promoting the objects for which the Societies were first organized and we are not aware of any excuse that should prevent those friendly relations, and frequent communications. It would greatly increase the influence of both Associations that they should be on the most friendly and intimate terms, actuated by the same spirit of pure and patriotic motives in promoting the improvement of agriculture and thereby the general prosperity of our country. When these friendly relations do not exist between Agricultural Societies who profess to have the same object in view, it renders them liable to have their motives questioned. The general, and not the sectional improvement of husbandry, should be the object of every Agricultural Society receiving Legislative grants, and this should appear manifest in all their proceedings. Mr. Buckland has sent several premium lists, which we have distributed agreeably to his request, retaining one at the Rooms of the Lower Canada Agricultural Society, which may be referred to there by any parties wishing to see it. We observe with much satisfaction that there are two classes of premiums, including horses, neat cattle, sheep, and agricultural implements, open to all competitors, although the prizes are certainly small compared with other classes and we only regret this circumstance as it may discourage parties to bring animals from a distance at a considerable expense. We do not by any means think it necessary to have a high scale of premiums, and the Highland Society of Scotland, and the Royal Irish Agricultural Society, act upon this principle this year. A numerous list of moderate premiums, will answer best in this country, and they have adopted this plan in the State of New York. The Premium List before us is also moderate, and numerous and reflects great credit upon the Association. We wish them every possible success and as numerous a meet-

ing as they can desire. We hope, though late in the field, that the Lower Canada Agricultural Society, may yet hold their proposed Exhibition, in Montreal, if not in Quebec. There is abundant time for advertizing for an Exhibition in October, and it would be better that farmers should come with their stock and produce as they are, rather than they should be previously prepared for the occasion.

It is generally considered in the British Isles, that in the improvement of stock by crossing, it is not judicious to proceed further than the first cross without having purity of blood on the one side. The first cross, if from judicious selections, may produce a very good breed, but to continue to breed from this cross, both male and female, will not produce the most profitable breed, particularly for dairy purposes. After the first cross, it will always be prudent to provide a bull of some pure breed, that is not greatly over the size of the cross breed. If we desire a good and profitable breed of cattle, careful selection, and attention to keeping a pure breed on one side is actually necessary. It is by this means alone that such perfection is attained in the British Isles in cattle and sheep, and without the same care and attention here, we never can obtain the best breeds of stock. The Canadian race of horses are extremely deteriorated by crossing and continued crossing until there is scarcely an un-mixed breed of Canadian horses to be found. We every day see marks of a cross with other breeds in horses that are represented as pure Canadian. These marks are unmistakable by any good judges, and we are confident that continued crossing in breeding horses, without perfect purity of blood on one side, is calculated to produce an inferior race of horses, and more particularly if the first cross is not a superior and suitable breed to cross with. A vastly increased value might be given to the stock of this country by due attention to these matters. Proper attention

to feeding would also be required. But by judicious management in all these particulars our stock might be doubled in value in a very few years, and this would be a great increase of the wealth of the country, that might be easily attained. No *decided* breed of animals can be produced by constant crossing, and no certain perfection can be attained from such mixtures. We recommend this subject to the consideration of farmers, and we can assure them it is worthy of all the attention they can bestow upon it.

In England, where it is admitted, they practise a better system of Agriculture than in any other country on earth, they find that one rotation of even "high farming" is not sufficient to bring land up to what it is capable of producing, but that it requires a series of rotations to put land into condition, necessary to render the cultivation of it profitable. It may, therefore, be imagined what state the generality of farms are in here, where so few adopt a regular rotation, and follow it up constantly. Indeed we think that as the proportion of green crops cultivated in Canada is so small, compared to the whole quantity of arable land, that it is impossible to adopt a good rotation, or keep the land in proper condition, unless a considerable proportion is regularly Summer fallowed to make up the deficiency of green crops. Summer fallow, must be kept up in the rotation, to keep the lands clean and in a due degree of fertility. Where a large proportion of a farm is kept in meadow and good pasture, there is not much danger of its becoming exhausted, by top dressing the meadows occasionally, and ploughing them up, (when natural grasses are found to prevail over the artificial grasses,) and putting them through a regular rotation and seeding them down again with suitable grass seed and clover. On farms kept for the supply of hay near towns, the cultivation of other crops should only be a secondary consideration, and they are

only necessary so far as required to keep the meadows in good condition for producing good hay for the market. This is not a difficult mode of farming, where the land is suitable, and convenient to market. The chief requisite is, that all lands in meadows shall produce the best quality of hay, as this will make the acreable value much greater. It is as much expense to dispose of inferior hay as that which brings the highest price. The grand foundation of all Agricultural improvement in the British Isles, is considered to be the feeding of stock. We are convinced that in Canada, we shall never have any profitable improvement in our Agriculture where most required, without having more of good pasture and meadows. Without these we cannot have good cattle, and without cattle properly kept, we cannot have good manure or good crops. The manure of stock barely kept in existence, fed on straw in winter, and poor pasture in Summer, is not much value to the land. In England, farmers use a proportion of oil-cake to feed stock, with a view of improving the manure of cattle, and they find that feeding on a proportion of grain also improves the manure. How different it is in this country. Few farmers here think of improving the manure of stock, by making use of grain or oil-cake for feeding. It has been clearly proved in England, that, the manure of cattle or sheep fattened on roots, is not of much more than half the value of the manure of cattle and sheep that have a portion of grain or oil-cake given to them with the roots. Farmers may imagine their own farming very superior, who have never seen or read of any other, but this is a very injurious delusion and checks improvements.

We recommend to our readers the following speech of Professor Johnston. It will give an idea of his estimation of Agriculture in North America, and there are few gentlemen better qualified to make a correct esti-

mate on the subject. He has seen good farming, and he can understand the difference between what is a good and what is a defective system of agriculture, and we may take his word for it that our agriculture is far behind that of Britain, and the sooner we are able to lessen the distance the better it will be for us. There is nothing in the climate or soil of Canada to prevent our agriculture approaching very closely the most perfect system practiced in the British Isles:—

PROFESSOR JOHNSTON.

At a recent meeting of the East of Berwickshire Farmer's Club, Professor Johnston, returned from America, at the request of his friend Mr. Milne, of Milne-Garden, delivered the following address, which we have much pleasure in laying before our readers:—

I will briefly refer to some points which came under my observation in that part of the country which I visited. First of all, as to the state of agriculture in the northern parts of America, in our own provinces, and in New England, with which we are ourselves more familiar, when I tell you generally that the state of agriculture in those parts of America is what the state of agriculture in Scotland probably was 80 or 90 years ago; and when I tell you that in some parts of New Brunswick they are very nearly in the precise condition in which Scotland was 120 years ago, you will have an idea of the state of agriculture in North America. The system of agriculture is no farther forward—it is exceedingly far behind. They are not even acquainted with the improved methods of farming, or the improved implements which are now in common use in this country; while the increased facilities which Mr Milne would still further introduce have never even been heard of by them. Now, in regard to this state of things in the whole of the northern parts of America, go as far west as you like, and as far south as you like, the same general description applies to the whole. Now, the next question is, how has this state of things been brought about? You are probably not all so well acquainted with the state of agriculture in this country 100 or 120 years ago as I have found it my duty to make myself, and at the time to which I refer, I allude not only to the state of great ignorance in regard to the cultivation of the soil, but the state of exhaustion in the soil itself. So in referring to the present state of agriculture in America, I refer to two considerations—the condition of mind brought to bear upon the cultivation of the land and the state of the land itself. In regard

to the cultivation of land in America, its condition arises from a variety of causes, and very few considerations will enable you to understand how it has come about. If you ask yourselves to what class does the majority of emigrants belong; you will have no difficulty in coming to a conclusion. Look at the great crowds of people who go from Ireland, from the Highlands of Scotland, and the hundreds of thousands proceeding from the great towns of England and Scotland—ask yourselves of what class they consist—what amount of intelligence and agricultural knowledge they possess; and in the answer to this you will at once find the key to the state of the land in the whole northern part of America. The people who first settled in America knew nothing of agriculture, and their descendants generally copied the habits of their predecessors. Thus it came that their sons knew nothing; out of the way of books—out of the way of instruction, supposing them to have even read books which gave instruction, they would have made very little progress; but we must suppose them not to have had an opportunity of gaining knowledge and therefore instead of advancing, they have retrograded in agricultural knowledge and practice. Now, what has been their procedure—by what kind of procedure have they brought about the state of exhaustion to which the soil has been reduced? Of course, in speaking of the exhausted soil, I do not refer to the virgin soil which has never received the plough or the spade, but to the soil under their cultivation, and which they are now exhausting. When I tell you how the land is cultivated, you will understand how this exhaustion has been produced. The forest is in the first place cut down and burnt, after which the ashes are scattered, and a crop of wheat and oats is sown. When this crop is cut down another is sown; but they do not always remove the straw—they do not trouble themselves with any manure. The second year they sow it in succession. When they can take no more out of it, they either sow grass seeds, or as frequently let it seed itself. They will then sometimes cut hay for 13, 14, 16, 18, or 20 years in succession, in fact as long as they can even get half a-ton an acre from it. And you may suppose what is the natural fertility of the land when they are able to obtain as much as three or four tons per acre at first and go on cutting it for 12 years. They will probably have two tons an acre during all that length of time. The land is then broken up, and the crop of oats taken—then potatoes—then a crop of wheat—and then hay for 12 years again, and so the same course is repeated. Now this is the way in which the land is treated—this is the way in which the exhaustion is brought about. This exhaustion exists in Nova Scotia, New Brunswick, Lower Canada in Upper Canada to a considerable extent, over the whole of New England, and extends into

the state of New York. The next inquiry which you will make, is, what steps they are taking to remedy this state of things? Are they doing anything to bring back the land to a productive condition? and, in order to do this, are they taking steps to put any knowledge into the heads of those who cultivate it? Now, on those points I am happy to say that I can speak very favourably. They possess the spirit of their forefathers, and having become conscious of the state in which agriculture really is, they are endeavouring to improve it. But you will ask what inducement have they to make these exertions? They grow corn enough—they have no want of agricultural produce as we have; but when I tell you what is the condition of New England in reference to the Western States you will understand. All the new States—all the virgin land, when it is cultivated, yields a crop for little or nothing, but it cannot yield by means a large crop. In the State of Michigan, between Lakes Superior, and Erie, the average produce is not 12 bushels an acre, but it is got for nothing. In New Brunswick, which is very thinly populated, I was told that 10 bushels an acre paid well; but the produce is not large. In the Western States they are enabled to produce it very cheaply.

Mr Hay.—What was the value of a bushel of Wheat?

Professor Johnston.—At the time I was there the price varied from 60 to 80 cents a bushel, *i. e.*, 100 cents being 4s 4d. In the extensive western states, and part of New York, where it is shipped to England, the price varies according to the distance. Now, the condition of things in the western States in reference to England is precisely the same as the condition of England in reference to the wheat-producing countries of the Baltic. The condition of the farmers is exceedingly bad, and in Maine, I was informed that they were all in a state of bankruptcy. The land is all mortgaged, which hangs like a mill stone round their necks, and is worse even than the state of the farmers in this country. They are thus unable to compete with the western parts of New York or Lake Ontario. You have all heard of the famous wheat of Genesee, where the land is more fertile than in any part of Great Britain, and I learned there that they are laying the land down grass, because they cannot afford to grow wheat. As a remedy for this state of things, they are establishing agricultural societies in the different states, and the legislature is providing funds to support these societies, and for the diffusion of knowledge. The central Society is in Albany, and to it the different branches send reports. The Legislature publish these in one thick volume, and circulate 20,000 copies gratuitously throughout the States. This central society asked me to give their annual address at Syracuse, and a course of Lectures before the legislature at Al-

bany. These lectures are to form part of this year's report; and the Legislature have resolved to print an additional 20,000 copies, making 40,000 altogether, and to circulate them gratuitously through the different States. Let us now come to another point of great importance, and to which you would perhaps like me to advert, viz., what will be the effect of an improved condition of agriculture in America upon us—what influence will the growth of wheat in the States have upon us—or what influence is the progress in agriculture, consequent on this great desire for improvement likely to have upon the state of agriculture in Great Britain? In New Brunswick, New England, Vermont, New Hampshire, Connecticut, and New York, the growth of wheat has ceased; and it is now gradually receding farther and farther westward. Now, when I tell you this, you will see that what I believe to be the case—that it will not be very long before America will be unable—in fact the United States are unable now—to supply us with wheat in any large quantity. If we could bring Indian corn into general use, we might get plenty of it; but I do not think that the United States need be any bugbear to you. I believe the great source of competition you will have to contend with is the Baltic and the countries on the borders of the Black Sea. Now, in regard to the other point, viz., what effect will the desire for improvement in agriculture have upon the agriculture of this country—it ought to stimulate us to still greater exertions. Sure I am, that with proper exertion, we will always keep a-head of them. There is as good blood in this country as ever went out of it. I hope English and Scotch heads and hearts will not become languid and dull on a matter of such moment as this, but that we will continue to beat them, as I am sure from what I have seen, that we are able. What the Americans can do well, we ought to be able to do better. (The learned Professor sat down amid great applause.)

ENVELOPE MACHINE.—We (*Manchester Examiner*) have been favoured with an inspection of a newly-invented envelope machine, patented by Remond, which is now being made at the Atlas Works (Messrs. Sharpe and Co's), Oxford-street. It is small and of simple construction, consisting of a "carrier," with "plunger" and "folding box," which has on one side a stamper, continually supplied with colouring matter, and on the other a plain bit of wood, covered with felt, and supplied with gum. The whole is worked by means of bellows. In working, the paper, which has already been shaped by a die, is placed on the "carrier," from which it is immediately taken off by a powerful aspiration from the bellows, and carried forward to the "folding-box," when the "plunger" drops on it, and squares it, the "stamper" and "gummer" on either sides dropping simul-

taneously on the edges. By another operation these edges are blown down, and the envelope, now gummed and stamped, is thrown off the machine by a side opening. The machine is worked by steam, and is capable, we believe, of throwing off from fifty to sixty envelopes per minute.

FRESH BEEF FROM AUSTRALIA.—We have lately had some beef submitted to our notice of most excellent quality, and perfectly preserved in tin cases, from Newcastle, near Sydney, New South Wales, of which considerable quantities are being imported into this country; and we earnestly recommend it to ship-owners, as an invaluable substitute and change for their crews once or twice a-week, instead of salt beef and pork, especially as this change will not involve an extra expense. Many masters of ships have used this Australian beef and certified to its general fine quality; and with emigrant and passenger ships it must come into extensive use, because it does away with the necessity for taking such large supplies of live stock; but a powerful recommendation is found in the fact that the Admiralty, aware of the great utility of using preserved boiled beef, for the crews of her Majesty's ships, have required tenders for the supply of 1,000,000 lbs.—*Shipping and Mercantile Gazette*.

A trial of Ploughs is to be made every day during this week, under the direction of the Executive Committee of the N. Y. State Agricultural Society; nearly forty different ploughs have been entered for the trial, the competitors being from New York, New England, New Jersey, Michigan and Canada. The Judges, who have been selected by the executive committee of the society, are gentlemen in whom the public have confidence; and they are directed, we understand, to pursue this trial until every implement shall be tested in the most thorough manner, and its character for performing the work desired, ascertained.

The trial commenced at 11 o'clock yesterday with stubble land. For this 12 ploughs were entered.

Alex. Fleck, of Montreal, drew No. 1.—Ploughman, Mathew Hutchinson, from Canada. The ground was in bad order from the excessive rains, yet the work was done in a manner that reflects great credit on the ploughman, as well as on the Wilkie Scotch plough, made by Mr. Fleck.—*Albany Argus*.

Party-Spirit—a species of mental vitriol, which we bottle up in our bosoms that we may squirt it against others, but which, in the meantime, irritates, corrodes, and poisons our own hearts.

Praise—that which costs us nothing, and which we are nevertheless the most unwilling to bestow upon others, even where it is most due, though we sometimes claim it the more for ourselves the less we deserve it: not reflecting that the breath of self-eulogy soils the face of the speaker even as the censor is dimmed by the smoke of its own perfume.

The intelligent have a right over the ignorant—the right of instructing them.

Pleasure loves the garden and the flowers; labour loves the fields and the grain; devotion loves the mountain and the skies.

We should be cautious in indulging in feelings of a virtuous indignation. It is the handsome brother of anger and hatred.

NOTICE.

THE Quarterly Meeting of the Directors of the Lower Canada Agricultural Society will take place at their Rooms in this City, on FRIDAY the 23rd day of August instant, at 11 o'clock, A. M.

By order

WM. EVANS,
Sec. L. C. A. S.

1st August, 1850.

GREAT AGRICULTURAL WORK!

THE FARMER'S GUIDE.

TO

Scientific and Practical Agriculture.

BY HENRY STEPHENS, F. R. S. E.*

Author of the "Book of the Farm," Editor of the "Quarterly Journal of Agriculture." &c. &c.,

ASSISTED BY JOHN P. NORTON, A. M.,

Professor of Scientific Agriculture in Yale College, New Haven, Author of Agriculture Prize Essays &c., &c.

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The work is divided into four departments, distinguished by the four seasons of the year, commencing with Winter, and Prof. Norton's notes will be published as an appendix to each part. The first chapter treats of the following subjects, under the head of

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On the best of the existing Methods for acquiring a thorough knowledge of Practical Husbandry. On the Difficulties to be encountered in learning Practical Husbandry, and on the Means of overcoming them.

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On the persons required to Conduct and Execute the Labor of the Farm.

On the Branches of Science most applicable to Agriculture.

On the Institutions of Education best suited to Agricultural Science.

On the Evils attending the neglect of Landowners and others to learn practical Agriculture.

On observing the details and recording the facts of Farming by the Agricultural Student.

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Vaudreuil, January, 1850.

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THE Subscriber begs to acquaint his Friends and Customers that he has, under the patronage of the Lower Canada Agricultural Society,

OPENED HIS SEED STORE,

At No. 25, Notre Dame Street, Opposite the City Hall Where he will keep an extensive assortment of AGRICULTURAL and GARDEN SEEDS and PLANTS of the best quality, which he will dispose of on as favourable terms as any person in the Trade. From his obtaining a large portion of his Seeds from Lawson & Sons, of Edinburgh, who are Seedsmen to the Highland and Agricultural Society of Scotland, he expects to be able to give general satisfaction to his Patrons and Customers. He has also made arrangements for the exhibition of samples of Grain, &c., for Members of the Society, on much the same principle as the Corn Exchanges in the British Isles He has a large variety of Cabbage Plants, raised from French seed, which he will dispose of to Members of the Society, at one fourth less than to other customers.

GEORGE SHEPHERD.

Montreal, April, 1849.

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AND

TRANSACTIONS

OF THE

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VOL. 2.

MONTREAL, SEPTEMBER, 1880.

NO. 2.

The Legislature have granted £2000 for the Industrial Exhibition which is to take place in Montreal in October next, and the Government have named Commissioners to superintend and manage the Exhibition. This is all as it should be, and we may expect to have an Exhibition worthy of Canada. So far as regards the products of Agriculture, we may be able to show some specimens equal, if not superior to those produced in any country. In a former number, we stated that no country could produce so fine a sample of hay as Canada, and this is one of the most valuable products of the farm. Our samples of grain may be very good, and we could compete, perhaps, with the grain of many other countries, but we feel persuaded that the samples of English grain will be superior to any that will appear at the great English Exhibition. Canadian peas might compete with those of any country. We can also raise good root crops, but in the British Isles, they raise better root crops, we believe, than in any part of the world. The soil and climate are favourable, and the cultivation, manuring, and management are superior to that of any country. There is most excellent butter made here, and we have seen cheese of Canadian manufacture, as good as any we have ever seen of the produce of North America. Upon the whole there cannot be any doubt that the agricultural products of Canada may afford samples for the great English Exhibi-

tion equal to any that will be sent there from North America, and perhaps equal to any produced out of the British Isles. With these prospects we should be perfectly content. It will show the people of the British Isles that Canada is favourable for the settlement of Emigrants, and for the employment of capital. It is to be regretted that among our products we have not more of flax, hemp, and the seed of each, which certainly might be raised here in considerable perfection. Even to supply our own wants it would be very desirable. The more extensive use amongst us of articles made from flax grown here should be encouraged. It would for many uses, be much preferable to cotton. In our warm Summers the entire wearing apparel of farmers and their labourers, might be made of linen and flannel produced, and manufactured in Canada. To a very large extent we might manufacture flax and wool grown by ourselves for domestic uses, and of better quality than what is in general use with farmers at present. The implements of agriculture of every description should also be of our own manufacture, from our own wood and iron, of which we have abundance. The Montreal Exhibition will be likely to do much good, by bringing samples of all the products of the country together, as well of agriculture as of manufactures. This good which may be anticipated, is apart altogether from the connection it may have with the great Industrial Exhi-

bition in England. Any party well acquainted with this country and its capabilities, must be perfectly aware of its vast resources and that they have not yet been developed to any thing near the extent they are capable of. Indeed there are few countries which possess a greater variety of resources for supplying all the wants of a large population notwithstanding our short Summers and long Winters. Some may doubt the fact, but we feel almost convinced that Canada is capable of producing a greater variety of the necessaries of life than the British Isles, and in a degree of perfection proportional to the skill and capital employed for these productions, where the production is not indigenous or spontaneous. There are many articles produced naturally here, which they have not in the British Isles. Maple sugar might be made here to a great extent, if care was taken of the trees, or a succession kept up by regular planting. The manufacture of this might be greatly improved by using suitable utensils and careful management. What an advantage it gives us to be able to produce Indian-corn, as well all as other grains grown in Britain? Indian-corn may answer as a green crop and will be more suitable for our climate than root crops would be.

In the articles of butcher's meat, although the British Isles are famous all over the world, for having the fattest animals that can be seen in any country, yet we certainly have meat sold in our markets, which we would prefer infinitely to a large portion of that sold in British markets, that is only fit for the manufacture of soap. We have most excellent mutton, lamb, and veal here, and when there is any that is not so, it is the farmers' fault. We have also excellent beef, and where can there be pork superior to Canadian? If any of these articles are not as good as they should be it is from the farmers' own neglect. Our beef, mutton, lamb, and veal, may be sufficiently fat for any purpose or for any table, and when they are so,

they are equal, if not superior, in sweetness and good flavour to the highly fattened animals of the British Isles.

We have very many valuable advantages, if we employ them, and work them properly. It may be truly said of Canada that it might be a land abounding in corn and cattle, in wool and flax, in milk and honey, in fruits and flowers, in wine and oil, and a thousand other articles that might be added to this list by the skill and industry of its inhabitants. It is indeed a land to be desired, and we may be proud of possessing it.

In the preparation of Agricultural products for the great Exhibition in England, they should be put up in the most careful manner, so as to keep good, and in the same state in which they are put up here, until they appear at the Exhibition. In reference to samples of grain of whatever kind, it should be in a perfectly matured and dry state, or it will not appear to much advantage in England. In shipping, it should be secured from vermin of every species. We had some samples of wheat, oats and barley, sent by a friend in England some years ago and on arrival here, it was found that rats had devoured and spoiled the whole. This may be prevented, as we had some sent out last year that was perfectly safe on arrival here. The most suitable method of putting up grain, would be in *good* bags, that would contain four *Imperial* bushels each, making half an English Quarter. Our minot contains, we believe, about half a gallon more than the English Imperial Bushel. The Imperial Bushel is $18\frac{1}{2}$ inches in the inner diameter, and $8\frac{1}{2}$ inches in depth, is to weigh 80 lbs. avoirdupois of water, and contains 2218-192 cubic inches. The height of the cone in heaped measure is to be 6 inches, and the contents of heaped measure is $2818\frac{1}{2}$ inches. The Canadian Minot contains, we believe, 2381.184 inches, but we do not know what the heaped measure contains. The Winchester-

ter Bushel contained 2150.4 cubic inches. All the inches are *English* measure. In putting up hams, or bacon, we have always found the best means of preserving them to be, to pack them in casks with the dry hulls of the oats that are taken off the oats in making oat-meal. This substance will keep them safe and good for many months, if they are good when put up. In putting up butter, it should be in air-tight firkins, containing about 56 lbs. of butter. There is no better plan of packing cheese than in boxes containing one in each. Bags containing 4 Imperial Bushels each will be convenient for every variety of grain if the grain put into them is in a proper state of dryness, which is a most essential requisite. It might be proper to send grain in the straw and ear of every species. Roots may be put up in barrels with dry sand, or with the dry hulls of oats which we have recommended for hams. In the October number we shall again refer to this subject, and submit our humble ideas for consideration. Samples of Timothy seed should by all means be sent to England.

A very considerable sale of eggs, takes place at our markets for the United States.— Chickens and fowls, are also purchased to some extent, for the same place. We may expect that this trade will greatly increase, as our means of communication with the States is more easy and rapid. This trade may be encouraged by all means, as it is only a method of disposing of our agricultural produce, *manufactured* into fowls, eggs, and chickens. We anticipate that our best trade will be with the United States, and this trade will, of course, be of reciprocal advantage to both countries, as the latter will not purchase unless what she requires, and it is advantageous to every country to be able to obtain, *at the least expense of transport*, what is necessary for her. Horses may be raised here for the United States to a great extent, and it is a trade not likely to fail soon. There are

many encouraging prospects to Canadian farmers, if they will only put themselves into a position to take advantage of the opportunities that may present themselves. Abundant, and *saleable* products, will place them in a position to supply the markets that may open to them, and abundant products will be sure to make markets. In a poor unproductive country, there will be neither markets money, trade, manufactures, or commerce. These are facts that will not admit of contradiction.

It is an extraordinary fact, that in some parishes where a considerable number of this Journal is subscribed for, the whole of the subscriptions are paid up, while in others, there are scarcely any paid. Several Agricultural Societies take copies for distribution, and pay for them, while other Societies do not take any. There can be no question that this Journal is published solely with a view of advancing agricultural improvement, and promoting the interests of agriculturists. It is ungenerous then in agriculturists to withhold their support, even, though it should not come up to their ideas of what an Agricultural Journal should be. It might be useful to know why some Agricultural Societies, and some parishes subscribe and pay for it, while others do neither. A large number of copies are forwarded to parishes where they are not paid for, but it is to be hoped they will be paid for yet. It is singular that the Journal should be estimated so differently by parties, when it is compiled for no particular party or locality, but for the benefit of Agriculture generally.

To the friends of Agriculture in every country, it must afford much gratification to see the "Reports" of the proceedings at the great Annual Meeting of the Royal English Agricultural Society, which took place in July last, at the city of Exeter. The pre-

paration for the Meeting and reception given to the great National Agricultural Society, was worthy of the people, and of the ancient city of Exeter, the capital of the beautiful County of Devon. It is encouraging to farmers even in this distant Province of the British Empire, to hear of the interest manifested for Agriculture at that great Meeting. All parties, and all classes, were unanimous in their exertions to prove their respect and regard for Agriculture, by doing all in their power to honour it. It is in England that Agriculture is estimated in proportion to its vast importance to that country, and to the world. In Canada, although our population are much more exclusively dependant upon our Agriculture, than the population of England are upon theirs—how is it estimated generally? What degree of interest would our principal cities and citizens manifest, and what sort of preparation would be made for, or reception given to a great Agricultural Exhibition? We are sorry to fear that it would be very different from what took place at Exeter. Agriculture with us, is undoubtedly of vast importance, but the fact is admitted in words, rather than by the adoption of measures calculated to encourage, and secure its prosperous condition. Is there any city or town in Lower Canada that would manifest such a deep interest, offer such a hearty welcome, and do so much honour to an Agricultural Exhibition, as it is our pleasure to report of the city of Exeter? We shall see, and it would afford us the greatest satisfaction to be able to report that there was. A prosperous condition of our Agriculture would prove the salvation of this country and it is impossible to secure its general prosperity by any other means. This is so manifest, that there cannot be any mistake. Agriculture must form the basis of our prosperity, and to expect to build it upon any other foundation will only bring disappointment. Manufactures and commerce,

growing out of, and supported by Agriculture, are very desirable, but, both are undoubtedly second in importance to Agriculture. The richest mines of copper, silver, gold and precious stones, were they discovered in Canada to-morrow, and however successfully worked, could never produce the same or an equal degree of prosperity and happiness to our population, that the judicious cultivation of the soil, and management of our cattle, would afford them, and who is it that would not prefer the healthy, pleasing, and honourable employment of the husbandman, to searching after gold in the bowels of the earth, or the mud of the rivers. And what is the value of silver and gold after all, except to purchase the products of Agriculture and of the lands in their various forms, as necessaries of life? Had we ever any doubt of the cause, we humbly endeavoured to advocate for so many years, these doubts would be removed, by hearing that the great and the good of other lands express their high estimation of Agriculture, and regard it as the most important and honourable occupation of mankind. Agriculture is not estimated by the wealthy and educated, in proportion to the profits it may return to them, but by the pleasures and healthfulness of the occupation, a residence in the country, surrounded by all the beauties of nature—an opportunity of seeing the progress of vegetation from the beginning of the Spring, until trees and plants, mature their products, and yield an abundant harvest. The domestic animals of Agriculture, that produce so many of the necessaries of existence to mankind, afford also, very great enjoyment to a resident in the country who can appreciate these things. All these enjoyments are of inestimable value to those who love the country, though they may be very little prized by those who prefer the town, and who perhaps, have seldom witnessed the rising or setting sun in Summer. Farmers who have to make a living by their

business must do so of course and spend according to their means, but the wealthy who reside in the country, and enjoy all the pleasures we have enumerated, with many others we might enumerate, should not be dissatisfied, although their balance sheet at the end of the year, should not show large profits. We must not forego this opportunity of giving a part of the "Report" of the Meeting at Exeter, and we particularly recommend the speeches delivered on that occasion by the representatives of two great Nations, France and the United States. These gentlemen appreciate the meeting and the exertions made in England to promote agricultural improvement. This "Report" should stimulate us to exertion—we cannot follow a better example than England affords us, so far as regards attention to Agriculture. It cannot fail to be a pleasing reflection to parties in Canada who are conscious of having done all in their power to promote agricultural improvement, when they hear of what is doing in the British Isles. Parties who can do more, will no doubt, employ all the means in their power, in future, to advance the interest of Agriculture, and promote its improvement, where it is most required. However we may fail in our argument to prove our proposition, Agriculture is of greater importance to the Canadian people than all other occupations put together, now, and at all future times.

DECORATIONS OF THE CITY OF EXETER

Are on a par with the magnificence of the other arrangements. From almost every window and house-top may be seen waving, flags of every description, from the magnificent silken standard of Southernhay, down to the cotton stocking hanging from the garret window of the west-end shop. Windows and doors are completely hidden beneath plants of all kinds. The town is a vast greenery, and one acquainted with the preparations would imagine that Stoke Wood had, in imitation of Rinnam Wood's trip to Dunsinane (though with a better object in view), paid a visit to the old city. But we are doing the descriptive rather irregularly, and we'll first ask our readers to step up as far as Peter Lis-

son's the best starting point for a more regular description. From the Acland Arms across the road to the higher corner of Summerland street is a splendid green arch, decked out with pictures (illuminated at night) expressive of the loyalty which everybody knows is so superabundant in the bosom of the worthy Peter; on the right of the face of that side of the arch looking up the street is a motto painted for the occasion, "God Speed the Plough. May Old England ever maintain her rights." In the middle is a loyal wish expressed that Her Majesty might live long and never forget the principle: which placed her forefathers on the throne. On the left is "Loyalty to our Queen, Submission to Her Laws, and Happiness to Her People." On the other side of the arch on the right is a painting of a soldier with his foot on a cannon, and the following motto under, "Quo Fata Vocant." In the middle, beneath a picture of Her Majesty, is "Long live the Queen and Prince of Wales; may Her Majesty never forget the Principles of her Forefathers; and may her Illustrious Offspring long live to protect our glorious Constitution in Church and State." On the top of the arch is a crown, the gaiety of the whole scene being greatly enhanced by an elegant display of flags. The effect of the view up and down the street from this spot is most enlivening, from the gay colours of the numerous flags playing in the breeze as if imbued with a spirit of the general rejoicing. Arches are also erected in Paris-street under the direction of Mr. John Ware. Fore-street abounds with flags of the most superior order, and the decorations generally are most superb. At the entrance of Queen-street is a magnificent green arch, 40 feet high, erected under the superintendence of Mr. Huxtable; on the top is a crown, of imitation gold and crimson, seven feet high, made by Mr. Vicary of this city, the ornamental work being done by Messrs. Dipstale & Bradley. On the side of the arch facing Fore-street, is lettered "Agriculture and Commerce," and on the side facing Queen-street, "Let Industry be praised," the latter having on one side a painting of the Castle of Exeter, with the motto "Semper Fidelis," and on the other the "Cornucopia." On one side of the former is a wheat sheaf, on the other side a vessel in full sail. On each side of Queen-street, as far as the market, an avenue of young fir trees is placed, the idea of Mr. Sobey, and which has a beautiful effect. Mr. George Ferris, whose superior taste is always discernable on such occasions, has decorated the top of the house, on which is the figure of the Queen, with signal flags, giving it the appearance of a yacht, which we have no hesitation in pronouncing the best show of flags in the city. The loyalty of the occupants of the fish market is most conspicuous, the place being decked out with flags, flowers and evergreens "whose silken eloquence, more rich than words"

(of occupants), testifies their right good feeling. The gaiety of the scene does not lack for a moment from one end of the city to the other, and Exe Bridge has one of the most beautiful arches in the town. On each side is a splendid fir tree nearly 30 feet high. The height of the first arch is 21 feet, and over which is raised another arch, about 13 feet diameter, lettered "Victoria," on each side of which is a fine orange tree in full bearing. The arch is composed of green holly and fir, and each side being ornamented with wreaths of flowers (*Lilium aurantiacum*), the arrangement of the whole showing the most exquisite taste. The arch was erected by Mr. Stafford, builder, Bartholomew-street, under the superintendence of Mr. Nott, nursery and seedsman, Bridge-street; Mr. Mogridge and Mr. Furse were also very active in carrying out the arrangement. From the top of South-street, to the bottom of Holloway-street there were several arches all erected by Mr. Mason.

MEETING AT EXETER.

The twelfth Annual Meeting of the Royal Agricultural Society of England came off last week in the ancient city of Exeter, and in no other place the Society received so warm and flattering a reception.

Though the proceedings of the show did not commence formally until Wednesday, the note of public rejoicing had already been sounded. Flags of all nations, parties, and colours, were hung out from the windows, triumphal arches spanned the principal streets, mottoes of a patriotic and agricultural character appeared on every side, with a due proportion of evergreens around them to set them off, and make them have a refreshing effect.

At the Pavilion Dinner, about 1200 noblemen and gentlemen were present. The following is the speech of the French Ambassador, Mr. Drouyn de Lhuys.—

THE FRENCH AMBASSADOR rose to return thanks and was received with a roar of applause. He said—Mr. Chairman and Gentlemen, I beg leave, both in the name of my colleagues and in my own name, to return you our best thanks for your most cordial welcome. We respond with the feelings of gratitude so fully due to your kind reception (cheers). Though without any pretention to practical knowledge of the details of agriculture, I have the utmost esteem for its manly and useful pursuit (cheers). Even as a passing traveller through this delightful country, so aptly called the "garden of England," I have had leisure to admire the spirit and energy exhibited by your landlords and farmers, with the view of rendering the land increasingly productive in proportion to the increase of your population (cheers). I was struck with wonder at

the sight of those alterations brought about through the labor of your experimentalists and the researches of your men of science. Whether I consider your superior breeding of stock, your improved implements of husbandry, your varied systems of cropping, your bold process of draining and subsoiling, or your happy application of chemical discoveries for remedying the defects or adding to the natural capabilities of your different soils—whether I behold around me your sturdy Saxon yeomen—(cheers)—yes, I say your sturdy Saxon yeomen and their blooming daughters—(renewed cheers)—well may I say never did Divine Providence grant a more promising land to a more deserving race (continued cheering). Once more I have the honor to return our thanks for your cordial hospitality, and I beg your leave to couple with the expression of those thanks a toast which, I am sure, will be received well by all of you—it is the toast of "Success to the Royal Agricultural Society of England" (reiterated cheering).

The American Minister, the Hon. Mr. Lawrence, on proposing a toast said:—

THE AMERICAN MINISTER then rose, and was received with an enthusiastic welcome. He said—My Lords and gentlemen, I have had placed in my hands a toast, which I shall offer with very great pleasure, inasmuch as it relates to the great interests of this country and of all other countries, inasmuch as to me there is no want of Harmony in those interests, if properly regulated (Hear, hear). Without touching upon any point that could give or would give the slightest umbrage or the least ill-feeling to any human being, I will, without further comment, announce to you the toast, at this moment. It is, "Agriculture, Manufactures, and Commerce" (cheers). A friend as I am to all those interests, and believing that the power and glory and interests of this country have been promoted by the encouragement of them all, I rejoice that agriculture is first (loud cheers). I came here not as a foreigner, I came here to claim relationship with you (Hear). I came here, for the first time in my life, to see the farmers of England with my own eyes (A voice, "Look at 'em") (laughter;) believing that when I saw them I saw the backbone of England (renewed and enthusiastic cheering). I know too well the history of my ancestors and of my kindred in England not to know that the farmers of England have always been loyal and true to the Crown; I know their history too well not to know that the battles of England and the glory of England are owing to the patriotism, the power, and the sacrifices of the farmers of England (vehement cheers). I came here because my ancestors were all farmers, and English farmers too (Hear), and I came here as the representative of a country whose great national interests are those which are founded in

the soil (loud cheers). I came here to pledge to you, and to offer to you in that kind and fraternal feeling which should exist between two great nations connected with each other by such enduring ties, the sympathies and the kind feelings of the great body of the farmers of the United States (loud cheers). I came here as their representative to tell you and to make you realize that they feel under great obligation to you for the experiments that you have tried, which we being young and not rich (laughter) are not able to try, while you have the capital, the skill, and what is more the science, which has been applied to the art in Great Britain (cheers). When I look to the state of your agriculture in 1850, and compare it with its state in 1820, I am perfectly amazed. I have been overwhelmed to-day—I have seen so much and heard so much that I hav'n't had time to digest it (laughter, and cheers). I have seen to-day that which I have never seen before. When I look back to this country only 30 years—and in the annals of time it is but a day—I look at a period when the average product of wheat was not more than from 20 to 22 bushels to the acre, and now all parties of all shades of political opinion agree that the average product is from 24 to 30 bushels to the acre (cheers). We of the United States have not the slightest jealousy of the agricultural interest of England (a laugh). We rejoice in every new agricultural improvement you bring out suited to your condition. We rejoice when we hear that through the application of agricultural chemistry you can produce another spear of grass in this kingdom. It has been said very truly that he who produces two blades of grass where one grew before is a public benefactor. I agree to that. If that be true, you are all public benefactors, because you are increasing the productiveness of your country. It is a matter for you and not for me to decide upon those great questions that agitate this country now; for I did not come here to enter into the political discussions of the British people. I may be allowed to have my own opinions, but those opinions will never be expressed in Great Britain, so far as regards the internal policy of Great Britain. But I can tell you that the more food you produce, and the nearer you come to providing a supply for the whole of your population, the more rejoiced I shall be and the country I represent. In regard to commerce there is not a man within the sound of my voice, I apprehend, who will not agree with me when I say that commerce, or navigation, or trade, or whatever name you may choose to call it, is essential to the prosperity of the agricultural interest (cheers). Commerce has been the great pioneer of civilization; and what country has done so much as this to civilize the world through the instrumentality of commerce? (cheers). I wish to do perfect justice to all interests, for I believe they are all in harmony. In regard

to manufactures it would be idle, futile, and foolish for me not to acknowledge that the manufactures of England—the spindles of England, if you please—have, in conjunction with this great, powerful, and patriotic body of men, the agricultural interest, fought the battles of Great Britain (cheers). To me there appears no discrepancy whatever in maintaining that all these interests are vital to the prosperity of this nation. In all great nations I believe these three interests are identical. It is for you to decide, and not for me, how far you may be willing to be independent of foreign nations for food (Hear, hear). That is a question that belongs to the English political casuist, and not to a man representing a great nation on the other side of the Atlantic, which is a great producer of food. That is a question I shall not touch upon. It would not become me. I did not rise for the purpose of expressing opinions in regard to the internal policy of this great nation; but I tell you that I should deem it a misfortune to my own country and to the world if, by anything, whether by the act of our own legislature or from any other cause, this mighty nation, Great Britain, should lose any portion of its power in the family of our nations (loud and repeated cheering). There is room for us all (Hear, hear). I desire to see competition among liberal—in fact, among all nations—but I desire most to see a competition existing between the old Anglo-Saxon and the young Anglo-Saxon (cheers). But let that competition be upon the principle—which of us shall most advance and diffuse civilization throughout the world? which of us will extend justice to feeble nations than ourselves—education, religion, the bible? (protracted cheering). Let that competition be this. Let us see which nations will do the most good (repeated cheering). I am happy to state that the United States is not represented alone by me on this occasion. I have on my right one of the most distinguished statesmen, and, what is better, one of the greatest and best farmers of the Union. That gentleman is the American ambassador at Paris, who has come here to meet you this day—His Excellency William C. Reeves, of Virginia. Nor are Mr. Reeves and myself the only representatives of the United States. In this room certainly—but in the vast assembly I cannot point out the precise spot—is a gentleman, one of the greatest farmers and stock growers of the Union, from the province of New York, Col. Morris, vice-president of the New York Agricultural Society, a gentleman who has been purchasing the stock of England very largely, that we in the western world may improve our own (cheers). Whatever you may think of your cousins on the other side of the Atlantic, I can only state to you, as their representative, that they are proud of their origin and rejoice that they are descended from the Englishmen (cheers). I hope at no distant day,

going on as we are at the rate of a million a year in our population, and we rejoice that we do increase, for we have room enough and food enough and labour enough for all—I hope at no distant day that we, your humble cousins, shall return to you, the farmers of England, to some considerable extent—it must be done by instalments (a laugh)—the great debt we owe to you in the agricultural line for the improvements you have made, for the instruction we have received, and for the great benefits our whole country has derived from your experience. I beg to thank the president and council for the opportunity afforded me to-day of being in this old Roman city of Exeter (cheers) and in this renowned country of Devonshire, distinguished for its rich red soil, its beautiful red cattle, and, in olden time, for its fine red cloaks (cheers), celebrated in poetry as well as in prose. It is renowned as the birthplace of that great and mighty man, Sir Walter Raleigh, the man who first went to the country of my illustrious friend, Mr. Reeves, a man whose name renowned in history will live as long as England exists. But before I sit down I must offer my thanks, as an humble individual, to the inhabitants of this city of Exeter. Wherever these annual exhibitions may take place, I think you will be fortunate if you find a city presenting so much neatness, so much simplicity, so much taste, and so much cheerfulness that one feels at home the moment he enters it (cheers). It is the first time I have ever set my foot in the county of Devon. I can only say I am indebted to the kindness of—I do not know what to call him (laughter); he is a general philanthropist, engaged in every good and great work—Sir Thomas Acland (applause). I believe it is to Sir Thomas I am indebted for the privilege which I enjoy this day. I am certainly indebted to him for his hospitality in entertaining me and my friends yesterday, last night, and to-day. And on the part of myself, of my country, and my countrymen who are now present, I feel under the deepest obligation to the Royal Agricultural Society of England for the opportunity afforded us of being here. I have said it is the first time I have ever set my foot in Devonshire—I hope it will not be the last (loud and long-continued cheering).

The Hon Mr. Reeves, American Minister to the French Republic, made the following observation in his speech. "It was his firm belief, that the pride and glory of England were to be found in that noble Agriculture, which, whilst it had improved the race of their useful animals had almost multiplied the fruits of the earth to an extent of which he could not form a conception,

until he saw with his own eyes that day, the prodigies which had been effected"—Such is the testimony of able, honourable, and disinterested men of the Agriculture of England, and we fervently hope that these "Reports" may have the effect of stirring us up to do all in our power for our Agriculture. How creditable it would be to Canada, if strangers coming to visit the country were to compliment them on the state of their Agriculture in terms similar to those we have copied above?—Yes—indeed—it would be the greatest honor that they ever can become entitled to, and it is in their power to gain such honor.

EXETER, SATURDAY.—To all intents and purposes the Great Western Agricultural Festival was over with the conclusion of the Pavilion dinner. Exeter next morning was thinning rapidly, and one by one the flags and arches, which made so good a show all the week disappeared.

At one o'clock, the dinner given to the humbler classes in the Pavilion took place, and the affair went off with the greatest possible *éclat*, and the most gratifying expressions of good will. The guests amounted to about seven hundred. At the chairman's table the mayor and corporation of Exeter were placed, and the raised side benches furnished accommodation for a number of ladies on gentlemen anxious to be present and so interesting an occasion. The good things provided were done most ample justice to. Indeed, it was delightful to see the celerity with which the plates were cleared, and the hearty enjoyment visible upon every face engaged in the process. The baron of beef formed the great feature of the entertainment. It was cut into two huge piles of meat, at one of which M. Sayer presided, and at the other his able coadjutor in the pastry department, Mr. Read; and the rush of plate bearers—for to some extent every man was his own waiter—amply proved that the courage of the guests was not abated by preliminary trifling with fowls and lambs. And so the baron *à la* Magna Charta melted like a snow-ball in an oven,

After dinner the MAYOR proposed the loyal toasts, and most loyally they were drunk in beer and cyder. The "Prosperity to the Royal Agricultural Society—the Founders of the Feast," was drunk; after which the Mayor passed a high eulogium upon the excellent and orderly conduct of the working men of Exeter during the Meeting. The speech was replied to by a

working man of the name of Upright, who spoke sensibly, with good taste and feeling, and very much to the purpose.

At the conclusion of the proceedings a wish was expressed on the part of the guests that they should shake hands with M. Soyer, with whom the notion of the entertainment first originated. The Regenerator accepted the proposal with enthusiasm, and stationing himself at the principal exit, had his hand shaken until it was all but shaken off by the enthusiastic guests. Altogether the occasion was an interesting one and a peculiar one, and it is to be hoped that the hint it affords will not be lost upon the Royal Agricultural Society at their future festivals.

In the evening a display of fencing and other entertainments attracted a large crowd to the Pavillion. M. Soyer was again the lion of the occasion, and, appearing in the insignia of his profession, cooked a profusion of cutlets with his magic stove, amusing the audience at the same time with an admirable gastronomic prelection. The display was applauded to the echo; and it is gratifying to be able to add that the ladies present caused the cutlets to disappear in no time. In fact, the sociable and *sans façon* style of the whole proceeding was most amusingly characteristic. M. Soyer will leave a great name behind him in Devon.

Thus then the proceedings of the Royal Agricultural Society have this year been brought to a very satisfactory termination. The Exeter Festival was full of new points and characteristics, and has no doubt a very salutary impression, and sown much good seed in the minds of the agriculturists of the Far West of England.

THE WORLD'S INDUSTRIAL EXHIBITION.

No. II.

*To the Editor of the AGRICULTURAL JOURNAL,
Montreal.*

SIR,—In a communication addressed to the Canadian Agriculturist, under date of 21st May last, I endeavoured to draw the attention of the Canadian public to the Grand National Exhibition, suggested by His Royal Highness Prince Albert, and to make some general remarks for the purpose of arousing the public mind to immediate and decided action in the matter. About the same time I addressed a letter to Mr. Logan, Provincial Geologist suggesting the immense the advantage that would accrue to the Province could he be induced to arrange and pack up his Geological specimens, revise his Geological reports and proceed with them to London and there exhibit them at the world's exhibition to take place in May next. In my note to Mr. Logan I made the inquiry if the government had made any overtures to him on the subject, or if the city of Montreal had done so. At the same

time I gave it as my opinion that no man in Canada could render such signal service to his country as he could by carrying out the above suggestions, thereby bringing this great Colony under the favourable notice of the British people. In personal conversation with Mr. Logan, I have been induced to believe that he would be most happy to meet the wishes of the Government should they entertain the same views of the subject. The time of meeting for the whole world has no doubt been well chosen, although in this country without a railroad to the ocean it is rather inconvenient, but still these minor obstacles must be overcome. Our American neighbours no doubt will tender to us the use of their many channels of communication to the ocean, to enable us with the least possible inconvenience to attend in London at the time appointed and I would fain hope that in case the British Government decline sending out vessels to her Colonies to carry home specimens of Colonial produce for the Exhibition, that those British Merchants in Britain connected with the Canada Trade will direct their consignees and agents in Canada and the other Colonies to give free passage and freight to the Delegates and articles to be said to the Grand Fair. I feel much pleased that the Provincial Government have been liberal in granting £2000 to aid this great work, and that they are now awarding liberal premiums for that object. A permanent and enduring service would be rendered to the Colony if one fourth of this liberal grant were to be set aside as premiums to be awarded in sums of fifty pounds for the best written treatise on each of the following subjects.

1st. On the best system of Moral Religious and Scientific Education applicable to the whole people.

2nd. On the Agricultural productions of Canada.

3rd. On the review of the Laws of Canada West.

4th. On a review of the laws of Canada East and their practical bearing on the prosperity of the Colony.

5th. On the best Geological report of the United Provinces.

6th. Best treatise on the practice of Medicine.

7th. On the best system of internal improvement, apart from Canals.

8th. On the best system of emigration to Canada.

9th. On the best system of Manufactures applicable to Canada.

10th. On the best mode of conducting the Lumber Trade.

I have read with no ordinary degree of satisfaction, Mr. Thomas C. Keefer's work on Rail-Roads and also his prize essay on Canals. The

reading of these works has suggested to my mind the benefit that might arise to Canada were the Government to offer premiums for similar essays on each of the foregoing subjects or on any other subject tending to improve and advance the interests of the Colony. This inducement would exert a powerful influence in bringing forth the latent talent of our country.

From a perusal of Mr. Keefer's last work, I learn that Great Britain requires yearly on an average nearly 2,000,000 barrels of flour over and above her own production of bread stuffs. Let Canada West continue to increase her produce in the same ratio that she has done for the last three years, and in two years she alone will be able to supply this deficiency and if so would it not give her some claim to protection, as we now pay off 20 per cent on bread stuffs exported and consumed in the United States. The internal wealth and resources of Canada only require an increase of Capital and population to rank her the finest Colony of the crown. Let any person who travelled through Canada twenty years ago, pass through it at the present time and he cannot say that her people are destitute of that energy of character necessary for her steady and permanent advancement. Let not, however, the present opportunity pass unimproved in bringing her under the favourable notice of the British Government. The highest amount of good that will arise from the World's great Industrial Exhibition will be the extension of friendly feelings among all the civilized nations of the Earth, and the softening down of national asperities, and by a frank and free interchange of opinions it will have a sure tendency to promote prosperity and peace.

Should you think the foregoing communication entitled to a place in your columns you are at liberty to insert it.

L'Orignal, 21st August 1850.

CHAS. P. TREADWELL.

President of the Agricultural Society of the United Counties of Prescott and Russell.

POULTRY MANAGEMENT.—I have always considered the rearing and management of poultry a matter of much more importance to the farmer than he is generally willing to believe. My poultry are of the same sort as may be found in any of the neighbouring farm-yards; the eggs of the largest and best hens have been selected for sitting, so that the stock consists of birds capable of covering 15 eggs, which is the largest number I ever placed under a hen. The cocks are changed every two years, taking care to supply their place with fine healthy birds of the previous year. Hens are useless after the third year; my plan is, in a stock of say 30 hens, to introduce 10 young pullets every year, and part with 10 of the oldest hens. One male bird must be kept to every seven hens; but when more than 50 hens are kept, one to every six is

necessary. On the proportion of male birds kept, depends, I am confident, the number as well as the successful fecundation of the eggs. About a month since, as an experiment, I placed 13 eggs, which I had procured from a farm-yard where the proportion of male to female birds is about 1 to 15, under a hen, and mark the result. From 13 eggs were produced three chickens; seven of the eggs, at the end of three weeks, were almost as fresh as when just laid, and three were addled. My chickens are fed twice a-day, in the morning about half past seven (later of course in winter,) and at two in the afternoon. Their food consists, during the five summer months, of dry barley, and from October till April, of boiled barley given warm, and 20 oz. per day each, of tallow cake or chandlers' greaves (the same as used by Mr. Huxtable for his pigs;) the cost of this latter is a fraction under a penny per lb., and is, I think, the best and cheapest substitute for the animal food they are unable to procure in the form of flies and insects, at that season. I have found by experiment that fowls will lay more regularly on barley than on any other grain. Hens during the period of incubation should be fed on dry barley, as the greater the heat maintained in the body of the hen the finer and more numerous will be the progeny. Never turn the eggs as some do; the hen will do this herself. Leave the chicks till nestled, i.e., till the down becomes dry; feed them on soaked bread for the first two days, returning them as soon as fed to the mother, after which they may be kept on tail wheat (and curds, if you have the milk,) until they are seven or eight weeks old, when, and not till when, they may be fed on barley and barleymeal, mixed with bran or pollard. I have this year only 18 hens and three cocks, the foxes having stolen rather more than one third of my stock during the winter; these 21 fowls consume a sack of barley, which costs now 11s., in 31 days, and have laid on an average 16 eggs per day since the 1st of March. I find the expenditure for corn, tallow cake, &c., for the old stock (not for the chickens produced by them) pretty nearly balanced by the receipts from the eggs one time with another. The following is the account, Dr. and Cr., of a stock of eight hens and one cock kept by myself, in an enclosed yard, during the year 1849.

DEBTOR.		£.	s.	d.
Eggs sold—number unknown, but furnished all food consumed by the nine fowls mentioned.....		0	0	0
Chickens reared. — 33 couple sold at 3s 3d.....		5	7	3
13½ couple reserved for stock for present year at 3s....		2	0	6
3½ couple of ducks at 2s. 9d.....		0	9	7½
		£7 17 4½		

CREDITOR.

1 sack of barley consumed by young chickens.....	£0	15	6
1 strike of barley for do., and grinding.....	0	4	4
1 cwt. bran.....	0	5	0
6 pecks tail wheat.....	0	6	0
Marketing expenses.....	0	6	1—16 11

£6 0 5½

£6, 0s. 5½., divided by 8, the number of hens, gives a net profit of rather more than 15s. for each hen.—*The son of a country Rector in Agricultural Gazette.*

GREAT MEETING OF THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND, AT GLASGOW.

On Wednesday evening, a lecture on manures was delivered in the Trades' Hall by Dr. Anderson, the chemist of the Society. The assemblage on the occasion, which was numerous, was almost entirely composed of agriculturists both from our home counties and from a distance. The learned gentleman was accompanied to the platform by the Lord Provost and the Duke of Roxburghe. On the motion of his Grace, his Lordship took the chair, and introduced Dr Anderson to the meeting; he was received with considerable applause.

Dr Anderson proceeded as follows:—It will be admitted, I think, on all hands, that there is scarcely any subject more deserving the attention of the farmer than the careful management of his manures. Under any circumstances this is a matter of vital importance; but the progress of agriculture, which now more than at any former time, compels every man to obtain from his land the greatest possible amount of produce, has given it even greater prominence than it before possessed, and necessitates a far more careful attention to the subject in all its bearings than it before required: and the introduction of what are commonly called artificial manures, has had the effect of still further complicating the whole matter. And opening up questions, which a very short time since would have been considered altogether beyond the range of such inquiries. The consequence of this is that our knowledge is at the present moment in a purely transition state, and is deficient in much of that definite information which is requisite for enabling us to arrive at legitimate conclusions regarding the comparative values of different manures, and many other points which it would be most desirable to have established in a satisfactory manner. In fact, any one who has occasion to inquire into those matters has questions constantly presenting themselves to him, in regard to which we possess no information at all

or other cases in which they render probable certain conclusions which might be established by the results of experiments made in the field, which have either never been made or have been done without those precautions required to raise them above the chance of fallacy. It has appeared to me that the present affords an advantageous opportunity of calling your attention to questions which must indubitably depend for solution on the mutual exertions of science and practice. For I hold it to be certain that the two must go together, and that though some of the facts we require may be determined in the laboratory, there are many questions which, though suggested by science, can be established only as facts by experiments in the field, performed with every attention to care and accuracy. I hold also that neither of these methods of experiment will in themselves suffice; they must go hand in hand if our results are to be of value. Separately the chances are that they lead to mere speculations, of which science will supply one set and practice the other, for you must allow me to say that practice occasionally ventures on speculations of its own. In discussing the general question of the economy of manures on the present occasion, I must be contented to do so only in a very general manner, as your time will not permit me to go into my details. My intention is rather to bring out some facts little attended to, and, if possible, to draw from the practical farmer such information as he may possess, or to induce some of those who now hear me, to add themselves to the number of those who endeavour experimentally to add to the common stock of information. And I shall advert, in the first place, shortly to the general properties of manures, and in doing this I may possibly have to touch upon some matters with which you may be already partially acquainted, yet which cannot, nevertheless, be too frequently brought under your notice. If we examine, then, any of our common plants, we find it to be composed of a considerable number of chemical substances. These substances may be divided into two great classes, separable from one another by a very simple experiment, which is neither more nor less than burning the plant. When this is done we obtain its *ash*, containing the whole of one of these classes; the other has, in the process of burning, passed into the state of gases, and so escaped the observation of our unassisted senses. The former of these are called the *mineral* or *inorganic* constituents of the plant, the latter the *organic* constituents, because they are peculiarly present in all organized beings. The latter of these classes is a limited one, and contains only four substances, carbon, hydrogen, oxygen, and nitrogen. The former is much more extensive, and comprehends a considerable number, of which the most important are sulphuric acid, phosphoric acid, lime, magnesia, potash, and soda. Now the existence of the plant depends

upon its obtaining all these, as well as one or two less important substances, in sufficient quantity; without these it cannot flourish, and just in proportion to the amount in which they are supplied will be the luxuriance of its growth. I say the growth of the plant will be proportional to the supply of these constituents. This statement, however, is not to be taken in its widest sense, because nature has fixed a certain *limit*, beyond which no supply of these substances, however liberal, will raise its growth but up to that limit the statement is substantially correct. From whence then is the plant to derive these substances? And in answering this question it is necessary to distinguish between the two classes of substances to which I have already referred and inquire separately into the sources of each. Of the inorganic constituents there can be but one source, the soil, namely, which to be fertile must contain the whole of these substances in greater or less quantity. It is different, however with the organic constituents which have a two-fold source, and of which part, or even the whole, maybe derived from the surrounding atmosphere. The atmosphere is, in fact a great reservoir of the organic constituents of plants of which it contains all four; two of these nitrogen and oxygen forming almost the whole of it; the other two, carbon and hydrogen, existing in smaller proportion in the forms respectively, of carbonic acid and the vapour of water. It must be understood, however, that all soils contain a certain quantity of the same substances, in form of what is called *organic matter*, in a state in which all these four substances may be supplied to the plant. Now, every *fertile* soil contains *all* the constituents of the plants which grow upon it, and that too in sufficient quantity to supply many successive crops, a position which I have had recently an opportunity of illustrating in a very complete manner in a series of analyses of the wheat soils in Scotland, published in the last number of the *Highland Society's Transactions*. I have there shown that even nitrogen, of all others, the element which we should least expect to find in them in abundance, nevertheless exists in what must be considered a comparatively large proportion. But it is important to observe that it is not enough that these substances shall exist in the soil; it is further necessary that they can become available to the growth of the plant. Now, to provide for this, nature has introduced an extremely beautiful and important provision. In order that these substances shall be absorbed by the plant, they must exist in a soluble condition. It is, however, very manifest that if the whole valuable constituents were soluble, the good effects of such an arrangement would be altogether defeated; for the rains would soon wash away from our soils all that they contain of valuable matter. To obviate this, however, nature has so arranged it, that these constituents exist in the soil in the

state of insoluble compounds, which, under the influence of air and moisture, gradually undergo a series of very complex decompositions, which slowly liberate the constituents, as they are required to support the life of the plant. But nature has fixed a limit to this change, and has caused these constituents to become soluble with extreme slowness, only, and in no greater quantity, than is requisite for supporting that amount of vegetation which the general economy of the globe requires. Now the whole principle of cultivation is to obtain, by proper treatment, from a given surface of land, a greater amount of vegetation than it is capable of producing in a state of nature. And this is effected partly by tillage, which breaks up the land, and by the admission of air and moisture facilitates the decompositions, by which these valuable constituents of the soil are liberated from their insoluble state. The other and equally important means is by the addition to the soil of those substances which the plant requires, in other words by the use of manures. A manure, then, ought to contain *all* the substances which a plant requires for its growth. And this is unquestionably what a manure of theoretical composition should do. Nay, more, it ought to contain these substances exactly in the proportion which the plant requires, so that no waste may occur. It must, however, be manifest to every one acquainted with agriculture, and still more manifest to every one acquainted with chemistry, that it is impossible to carry out practically what is true in theory: nevertheless, the aim of skilful and scientific practice ought to be to approach as near to theoretical perfection as it is possible to do, though in the very nature of things, we cannot even hope absolutely to arrive at it, or even near it. Although, however, we cannot hope to arrive at perfection, we may advantageously aim at a somewhat lower and less difficult standard, for experience and science concur in showing that all the constituents of a manure are not equally important, but that those are more essential which the plant has greater difficulty in obtaining from other sources. Now, in this point of view, nitrogen is the most important of all the constituents of a manure, because it is that which nature supplies least abundantly. You may possibly express some surprise at this statement, considering that I, not many minutes since, mentioned that it is at present in enormous quantity in the atmosphere. But it so happens that nitrogen is exactly of all others the substance which most peculiarly requires to be presented to the plant in a special condition. It has been established on most unequivocal evidence that the plant cannot absorb nitrogen *as such*, and that all this immense mass of nitrogen existing in the air is not directly useful to the plant, while it is only a very minute quantity existing in it, in the state of ammonia, which is of im-

mediate value. Of the immense disproportion between the amount of nitrogen in what I may call an inert and active condition, some idea may be formed when I mention that 100lb. of atmospheric air contains about 77lbs. of nitrogen, and, according to a recent determination not more than $\frac{1}{4}$ of a grain of ammonia. I shall not attempt to enter here upon the question of how the nitrogen of the air passes from its inert into its useful state—a question of much intricacy, which has occupied the attention of many distinguished chemists, without having as yet obtained a perfectly satisfactory answer. It is certain that, under peculiar circumstances, the nitrogen of the air may pass in small quantity into the state of ammonia, but the supply so obtained is small and uncertain. The great source of ammonia is the decomposition of animal and vegetable substances, containing nitrogen, which sooner or later, give off the whole of that element they contain in the form of ammonia. Next to ammonia in importance may be placed phosphoric acid, which is likewise a comparatively rare natural product, and of which also the great source is in animal and vegetable substances, all of which, but especially animal substances, contain it in quantity. It is true that it is found also in the mineral kingdom; but it exists so sparingly that as yet scarcely any advantageous use has been made of that which is obtained from this source. You will observe then, and it is a matter of great practical importance, that the principal source of the two most important constituents of plants is from plants themselves; for even that portion obtained from animals comes originally from the plants upon which these animals have fed. And the same may be said of potash, of which the great source is still from plants. This is a point which I wish to impress particularly upon you, that plants form the great source of these substances, and that this is true, not merely of these substances as manures, but even when you go into a druggist's shop and buy pure ammonia, phosphoric acid or potash, every atom which you get has at some time or other existed in a plant or an animal. These observations lead me directly to the consideration of that manure which consists of the decomposing portions of plants, and that of course is farm-yard manure, the most important of all, that on which the farmer must always be mainly dependant, and, I think I may also say, that, regarding the economical management of which we have the least amount of definite information. I beg it to be understood as my decided opinion, that farm-yard manure must always be the farmer's mainstay. I am aware, indeed, that some have thought otherwise, and we have all heard of an eccentric gentleman who expressed his opinion, that the time would come when the farmer would carry his manure to the field in his waistcoat pocket; and though no one is now-a-days so absurd, some people will

seem to expect that some complete substitute will be found for farm-yard manure. I can assure you, however, that any such supposition is entirely extravagant, and is certainly uncountenanced by chemistry. I do not mean to say that chemistry could not produce a substitute; but what I mean is, that the farm-yard manure must always be much cheaper than any substitute which could be manufactured, and the reason is to be found in the fact that the constituents of such a manure must be extracted from plants, which must necessarily be expensive. While even supposing that to be done, farm-yard manure *must*, in the very nature of things, still always be produced. No question can then be conceived of more importance than of obtaining this manure in its most perfect of state, but how that is to be done is exactly one of those questions still unsettled, and which I believe to require very complete and careful field experiments. The exact chemical estimation of the comparative values of different specimens of this manure is a very difficult matter; partly from its extremely complex nature; and, partly, from the many questions it involves. Of course, good farm-yard manure will contain more or less of all the constituents of our crops; but in estimating its value, we must be contented to take into consideration only its most important constituents, and, in this way, I conceive we may obtain a sufficiently near estimate, by knowing the amount of nitrogen and phosphoric acid which it contains; but of these, for many reasons, the first is by far the most important, as it is in respect to it that the value of farm-yard manure appears to vary most. In the management, then, of farm-yard manure, two different questions require to be considered. First, the production of a manure containing the greatest possible amount of nitrogen and, secondly, the successful conversion of that nitrogen into ammonia. It is not unimportant, of course that the other constituents of the manure should be present in abundance, but it may be assumed, as generally true, that the treatment likely to produce the greatest amount of nitrogen, will be that which produces the most valuable manure in other respects. In regard to the first of these questions, there is a want of definite information. It is a common statement, however, that the value of the manure is dependent upon the nature of food with which the cattle, which produce it, are supplied. That, for instance, cattle fed upon oil-cake produce superior manure to those fed on turnip. I am aware that this opinion is not universal, as I have heard it disputed by farmers of skill and experience. I am inclined, however, to believe that it is to a certain extent correct. Supposing, then, that two samples of such manure differ, it must be obvious that it is the dung and urine of cattle which differ; the *litter* mixed with such dung will be the same in both cases. Now, some experiments

made in the laboratory, on the pure dung and urine of cattle fed on turnips and oil-cake, appeared to me to confirm the opinion of the greater abundance of nitrogen in the produce of animals fed with the latter food. It will not do, however, to draw conclusions in such cases from a single analysis, so that I was anxious to have repeated and extended the experiments, but circumstances not within my own control have hitherto prevented my doing so. I would beg you however, to observe, that supposing it to be made out distinctly that farm-yard manure produced by oil-cake contains more nitrogen, than that from turnips, that still this would not embrace the whole question. It would if you were to buy the manure, when, of course, all that you want is to get as much nitrogen as possible in the 100 tons or any other quantity which you may wish to buy. But it is quite another thing when you come to produce the manure on your own farm. The question then is, not whether 100 tons of the one contain more nitrogen than 100 tons of the other; but whether the whole quantity of nitrogen produced by the one method of feeding is greater than the whole quantity of it produced by the other. Now, we have no experimental information on this point; but I think it may be doubted whether in this point of view there is any such difference, because, you will observe that though oilcake contains more nitrogen—in fact about 3 times as much as turnips—still there is a much greater disproportion in the quantities of these substances with which you supply the cattle. If you take away from an ox a certain quantity of turnips and replace them with oilcake, you do not allow an equal weight, but perhaps not more than one-fifth of the latter substance; so that in fact, the ox fed on oilcake actually on the whole receives less nitrogen than when fed on turnips. All these are matters which I do not give as facts, but as questions, which it would be most desirable to have determined by careful and repeated experiment; it would be a great boon to agriculture to have it set at rest, and I may be permitted to hope that the observations I have now made may be the means of inducing some one to engage in the inquiry. To pass then to another question—supposing cattle to be fed in exactly the same way, so as in fact to produce manure which at the moment of formation is of uniform quality, what are the circumstances under which that manure can be preserved with the least loss of its valuable matter? This question is one of the utmost importance, and calls for the discussion of so many points that it will be impossible for me to do more than refer to it very shortly. On some of those it would be difficult to enter without complicating the matter by opening up the discussion of other subjects;—I allude here to what is called box feeding, and feeding on boarded stalls, and sundry other modifications which,

independently of the feeding question, have been lauded by their supporters as producing greatly superior manure. I am too little acquainted with the practical results of any of these systems, which so far as I know have been only recently introduced into Scotland, to venture an opinion on their comparative merits. I have little doubt, however, that the manure produced must be superior in quality to the old farm-yard dung prepared in a most imperfect way. But what degree of superiority they possess has not been determined by any satisfactory experiments which have come under my notice. The matter must, in fact, be decided in the same way as other manure questions by ascertaining not merely the amount of valuable constituents present in the manure, but also the whole quantity produced in a given time. As regards the general question of the preservation of manure, I apprehend that the most important matter is its protection from air and moisture. In the way a common dung heap is made, we have, in fact, exactly the conditions to occasion loss of its valuable constituents. It is exposed to a more or less free current of air, which facilitates the volatilization of the ammonia as it is formed; and it is exposed to the falling rain, which washes out the soluble salts, and what ammonia the winds have spared, into the subjacent soil. It is true that the former of these sources of loss can be got the better of by the use of acids or of gypsum and mixing with dry earth; but when the ammonia is thus fixed, as it is said it is fixed only as regards *volatility*, for is still *soluble*, and liable to be washed away by rain. In order to have farm-yard dung in the best state, it must be preserved under cover; and, my impression is, that the introduction of covered dung-pits is likely to prove of great importance. There seems to be no doubt that in this way manure, in whatever way produced, must be best preserved, there appears, indeed, to be but one objection, which is the expense of erecting a roof of sufficient extent to cover the whole manure of a farm. But, surely, in these days of cheap building, some sort of inexpensive cover may be contrived. In order to ascertain this, we should have to ascertain, by actual *experiment*, what is the amount of gain by having the manure kept under cover, so as to know whether it is sufficient to leave a profit on the expense of covering it. We have another matter to attend to, also, in the management of farm-yard manure—its fermentation, namely by which is meant the production of such a decomposition as converts the nitrogen present into ammonia. The importance of this decomposition depends upon the fact that by this means, we obtain a manure which acts with greater rapidity than one in which this decomposition has not been effected. The fact is, that the formation of ammonia takes place much more slowly, when it has been incorporated with the

soil, than when it is heaped up in the dunghheap; and, as the nitrogen must pass into the state of ammonia before it is absorbed by the plant, we require to effect as much of that change as possible if we are to have a manure of rapid action. Having said thus much of farm-yard, he would next speak briefly of liquid manures. The question was a very wide one, upon which he could not enter at length, and was to some extent an economic one; for to ascertain either the real or comparative value of liquid manures, they must be guided by economic results. As they would be aware, there existed a great variety of opinions as to how these were to be obtained. He was of opinion that liquid manure would be most economically employed, if it could be cheaply converted into the solid form. There was, however, only one process by which it could be done, and this was evaporation, and to effect that would be more expensive than its application in the liquid form. This was more properly a purely economic than a scientific question, and therefore he would not dwell on it. He had referred hitherto solely to the class of natural manures, and he had laid before them his view, that no artificial manure would ever prove a substitute for that of the farm-yard; but though that was the case, they might be, and he believed were, most important auxiliaries. Let them take the commonest kind of artificial manure—he meant of course, guano—the finest quality of which was the cheapest and best of the class. He said the cheapest and the best, and it must necessarily be so, because the constituents which were of greatest value to the agriculturist were given it in a larger quantity than they could be got in any other compound for the same money. His advice then would be to buy the best guano—never purchase inferior. The inferior was greatly more expensive. The decrease in the money value for which it might be obtained was nothing to the decrease in its valuable constituents, as compared with the better sorts. The Peruvian was the best kind of guano, and it was by far the cheapest. Farmers were exposed to much risk of imposition. In this matter, adulteration was carried on to an extent which it is difficult to credit. He had recently gone over the number of samples of guano which had been forwarded to the laboratory of the Society for analysis, to the number of 30 cases, and he found that out of that 30 there had been 9 samples of such a quality as he himself, if purchasing, would have been disposed to accept. And this gave no accurate idea of the proportion of good or bad guano that was in use. Numerous samples of good guano came to the office, but few of those that were thoroughly adulterated, because the vendors of such took care to keep as far as possible out of the reach of the chemist. Let them take guano of the best quality, and they would find that two substances entered largely

into its composition, viz; ammonia and phosphoric acid, the two substances, as he had previously stated, the presence of which was most valuable in farm-yard manure. Now, in Peruvian guano they would find about 17 per cent. of ammonia and of phosphate of lime, a compound of lime and phosphoric acid, 23, 24, or 25 per cent., according to circumstances. In inferior guanos, there might be found 23 or 24 per cent. of phosphate of lime, and one or two of ammonia; and this, instead of being sold at one-third of the price of the other, as it should be, was sold generally at two-thirds. Guano might be considered as the type of a class of manures, and bones might be taken as belonging to it also. The value of that kind of manure was dependent upon two conditions. Some used burned bones. Now in certain circumstances, that might be advantageous. The addition of phosphate of lime might alone be needed to certain soils. Such a case occurred in the pasture land of Cheshire. The application of bones to that exhausted soil operated almost as a charm upon it. The peculiar nature of the tillage under which it had been kept—all the butter and cheese raised upon it being conveyed elsewhere—reduced it to such a state that the addition of phosphate of lime acted perfectly, and was indeed beneficial. But in general such could not be the case, and therefore they should give the preference to bones that were unburned. There was another instance of a similar kind to which he might refer. In many cases he believed that bones were sold from which the glue had been extracted by boiling. This glue was a valuable commercial product. It was used in weaving, for stiffening yarn and other manufacturing purposes; and several manufacturers had large boilers in which this glue was extracted. The bones were sold afterwards at no diminution of price from that of unboiled bones. In conclusion, the learned Doctor presented a summary of the views he had advanced, reiterating that farm-yard manure could never be altogether set aside by artificial; but though such was the case, they were indebted to the latter for the great extension of cultivation that had taken place of late years. The reason why farm-yard manure was thus important, he hoped he had made plain, as also the necessity for further experiment to confirm or confute many views now broached and to a certain extent entertained. In fact, the observations he had made might be taken not so much as the results of experiment as the suggestions of those experiments that were requisite to test many of the theories to which he had alluded. The learned gentleman resumed his seat amidst much applause.

The Lord Provost then proposed a vote of thanks to Dr. Anderson for the very interesting lecture he had delivered.

The Duke of Roxburgh cordially seconded the motion, which was carried by acclamation.

Agricultural Journal

AND
TRANSACTIONS
OF THE

LOWER CANADA AGRICULTURAL SOCIETY.

MONTREAL, SEPTEMBER, 1850.

We have seen several visitors from the United States to Canada this summer, and a few Canadians who have made tours in the United States, and all concur in opinion, as to the capabilities of Lower Canada for agriculture, that they are generally superior to any of the Eastern States of the Union, with the exception that our winters may be longer, and more severe than in some of these States. Of the correctness of this favourable estimation of Canada, there cannot be any doubt. The only draw-back that we have been liable to, is in the production of fall wheat, that we have not grown it to any extent. We have this year seen a most beautiful field of fall wheat grown by James Logan, Esq., in the immediate vicinity of Montreal. It was in every way a superior crop. It may be replied that last winter was very favourable for fall wheat, and that success in growing under such circumstances, can be no general rule. We believe that if land was well drained and properly prepared, the wheat sown in time (at latest, previous to the middle of September) sufficiently covered either in drills, or tightly ploughed in, that fall wheat might be grown in Lower Canada. The great danger is in the Spring by freezing and thawing alternately, that the plants are thrown out of the soil, if not well drained. They are, however, liable to the same injuries in the United States, but they sow early, on summer fallowed land, and the wheat has a firm root in the soil before the winter sets in. We cannot admit that our country is inferior to any in North

America, but on the contrary, there is no doubt, that the cultivated portions of it, are capable of yielding a larger produce of corn, and cattle, acre for acre, than any part of North America, notwithstanding the length and severity of our winters. If we are behind or deficient in our products, it is our own fault, and the remedy is in our own power. The country or its products, are not to be estimated as they appear at present, but as they might be. Objections are made to our cattle, and our pastures, as being very inferior, but that is certainly not through defect in the natural quality of the soil or climate, or the race of cattle. We might have most superior pastures here, equal, we believe, to those of any country, as the lands are generally productive of natural clover the first year they are left unploughed. If we had excellent pastures what would prevent us from having good meadows, and with both these, why not have good cattle and sheep? We have heard objections urged to our cattle because they are not very large frame and bone, standing very high with great horns; but this sort of stock, we humbly conceive, would not be the most suitable or profitable for this country, *under any circumstances*. Short legged, small boned cattle of moderate size, will ever be most suitable and profitable for this country, and probably for any country. We do not wish to be understood as advocating the expediency of keeping very small sized animals. We only propose that our animals should be of moderate size, well shaped, small bone, but of large carcase in proportion to bone, and not to be *chiefly* legs, bones and horns. We admit that there may be small sized animals very unsuitable for meat or dairy purposes, but these are not the sort of animals to choose for usefulness or profit. It is only by careful selection and attention in breeding, that useful animals can be obtained. It could not be expected that neat cattle or

sheep, would be in superior excellence, where no selections are made for breeding, but all the females are allowed to breed, and at any age that they may do so. There may not be any objection that heifers of good size, and well kept, should breed, or have their first calf at two years old, but to allow those of small size to breed at that age is very objectionable, and completely checks their growth. With sheep it is the same case, they should not be allowed to breed until their second year, unless of good size, and well kept. Sheep at one year old, are not able to feed their lambs, if they are not of good size, and well fed. Farmers in the old countries, who are desirous of having good sheep, seldom allow the ewes to breed until after their first shearing. When this plan is found necessary in the British Isles, where sheep are much better fed, in winter and Spring, than in Canada, it may be imagined how much more necessary it is here, if we desire to have fine stock. It may be answered that it would not be profitable to allow sheep to remain the first year without breeding—but we would observe, that when lambs are allowed to breed the first year, they will not produce so large a fleece of wool, their growth may be checked, and they may not raise a lamb after all. The lambs or calves of young cattle, or sheep of one year old, are seldom of good quality, or fit for raising. Some farmers may so keep their stock at all seasons, that it might be quite proper to deviate from the plan we submit. For the generality of farmers, however, we conceive it would be their interest to adopt the plan we suggest, in breeding cattle and sheep. There is nothing to prevent us having a useful and profitable stock of cattle and sheep here, without incurring any great expense, except the observance of rules that are manifestly required in every country in the management of

cattle and sheep, to have them of good quality and profitable.

We have frequently been told that it would be better that we should copy more for this Journal from American Agricultural periodicals, than from Agricultural periodicals published in the British Isles. We, however, are fully persuaded that we cannot find in any Agricultural publications, better, and more practical information on every branch of improved husbandry, than is to be found in those published in the British Isles. We make this statement advisedly, and as a practical farmer of long experience. We say now and we have always said, that the more closely we follow and adopt the best and most approved practice of British husbandry, the better, and more profitable will be our farming. We do not say that we should follow them in every thing, but we certainly may do so in most things with advantage and profit. There is not an Agricultural publication of North America that can teach us better systems of husbandry than we can find in British publications, and than what we have learned by practical experience all our life. We should hope that this Journal would be one to copy from on Agricultural subjects, rather than be a copy from other publications. We possess the very best means of information on the subject of improved Agriculture, we have had a long practical experience, and therefore, if we are capable of employing these advantages properly, this Journal should not be second to any published on the same subject in North America, and we trust it is not, and shall not. The farmers of Canada will find as good farming in their own country, as they can find in North America, we can assure them of that. The general state of our Agriculture is defective, and very much behind the improved system of the British Isles, but we certainly can receive as

good practical instruction in the art of Agriculture within the Province of Canada, as we can find on this continent. We may very well take upon ourselves to lead instead of following, and there cannot be any mistake that Canada is capable of doing so. Our soil and climate are excellent, and we possess sufficient of practical skill in the country to show an example, and instruct the ignorant in good husbandry. All that is required is to put our many advantages into practical operation. We need not go to seek instruction beyond what we possess within ourselves, if we make a good use of what is in our own power. All our Agricultural implements may not be of the best description, but we have some of the most essential, that cannot be surpassed, and there is nothing to prevent us having them all so, made upon the spot, from English models, that are the best in the world. There are not better Agricultural implements on this continent, than some that are made in Montreal, such as ploughs, harrows of various kinds, grubbers, carts of every description, churns, cheese-presses, and many other articles of excellent form and workmanship, not so much for making exhibitions at shows, as for practical use in the farmers' fields. We have seen a churn made in Montreal, worth all the churns we have seen in America. It combined elegance of form, size, strength, and excellent workmanship, and capacity to make over 100 lbs. of butter at one time. This is something like a churn for a dairy, and a correct picture of it would be worth giving in an Agricultural Journal. There is a commencement made in Montreal of manufacturing Agricultural implements, and we hope that in a short period we shall be able to show all the implements required in Agriculture, of the most suitable form and adaptation to their several uses, and of the best materials and workmanship. We forgot to mention our Fanning machines, and wood and wire riddles and

screens, of every size required for cleaning grain or small seed. All we have enumerated are the best of their kind, and capable of executing well, the several works for which they were made and adapted. We have no reason to be ashamed of ourselves. If we cannot show a very large number of implements, we can show the most material to the farmer of the very best description. We confidently hope and trust that ere long Canada will be able to lead in a good system of husbandry in North America, instead of following the example of any other country this side of the great Atlantic.

We have not been able to give any illustrations in this Journal, and we suppose this want has been complained of by some parties. The expense of procuring illustrations that would be worth having, would be considerable, and unless they were perfect, or gave a perfect idea of what they were intended to represent, we conceive they would be more calculated to do harm than advance Agricultural improvement. In the case of animals, we have seen lately, some illustrations pretending to represent certain animals and we look upon them as ridiculous caricatures, giving no correct idea of the shape of the animals that would enable one to form any just estimation of their merit. In the Farmers Magazine, published in London, that certainly possesses merit equal if not superior to any other Agricultural publication, they seldom give any illustrations, except two beautiful copperplate engravings of superior animals executed in the very best manner in each Monthly number. If there are any others given, it is very rarely, and only of some new invention, and they are executed in the best style. We receive some of the best Agricultural periodicals published in the British Isles, and they seldom have any illustrations, except those in advertisements appearing in them. It would be very de-

sirable certainly that *correct* drawings should be given of any *new* and *useful* inventions not known to farmers, or new and *approved* plans of farm houses and buildings, but we do not think that the Agricultural Journal should be made the medium of *advertising* for parties, unless such advertisements were paid for, and then there could be no objection to any number of illustrations appearing on behalf of the parties advertising, and on extra sheets that would not diminish the present size of the Journal of Agricultural information. Picture books are very amusing to children, who do not require that the pictures be very exact representations if they give a mere outline, and are well coloured. Illustrations for an Agricultural periodical, however, must be well and correctly executed, to make them useful, and should only be given of the most approved implements, the best constructed farm buildings, and new and useful inventions. Any parties who desire to have their implements or other articles they have to dispose of, made known to the public, let them give correct illustrations and descriptions of them in an advertisement for which they will pay, and subscribers to the Journal will be able to form their own estimate of them. This Journal should only recommend by illustrations or otherwise, such implements, plans of farm buildings, or other things as have received the stamp of general approval formed from practical experience. We have seen frequently, illustrations of implements appearing in Agricultural periodicals, that would be useless to a farmer, for any purpose but to look at, and serve no good purpose by insertion, except as advertisements for the manufacturer or vendor of the articles. We wish to be distinctly understood, not to object to illustrations being published, provided they are such as we have endeavoured to describe—calculated to increase the usefulness of this Journal, and to promote the objects for which it is published

—the advancement of Agricultural improvement in Lower Canada.

AGRICULTURAL REPORT FOR AUGUST.

The month of August was very favourable for completing the hay harvest, and for securing any grain ready for cutting. With the exception of one week in the commencement of hay harvest in July, we have seldom seen a more favourable season for harvesting hay in good condition. In the week we mention, some hay was injured, certainly; but for the remainder of the hay harvest, there was no difficulty in securing the crop in the best condition. Hay is a material crop of the farm, and it is a great advantage to have it uninjured and well saved, which it may be, generally, this year. Heavy rain or showers upon hay in the process of saving, destroy all the best qualities, and render it of little value, except for manure. The weather was beautiful for cutting and securing wheat and barley, and we believe all the latter, and much of the former, is safely housed. Barley was not sown this year to the usual extent, in consequence of the low price paid for it last year, and the quantity raised is certainly short of former years, but it may be equal to the demand. Farmers, however, should not give up the sowing of barley, as it can be employed in feeding cattle and pigs, if brewers will not pay a reasonable price for it. It is much the best crop to sow grass-seed with, in laying down land, particularly when wheat is sown so late as the latter end of May and beginning of June. To sow grass-seed at that advanced season of the year, is very uncertain if the month of June is dry, and it is a great disappointment to a farmer, when he proposes, or has his land in a fit state to seed down for grass, to have the grass-seed fail. If he has to plough it again, and take another crop of grain, the land may not be

in good condition ; and where a regular rotation is attempted, it is quite deranged. When land is prepared to be seeded down, we should prefer incurring the risk of sowing wheat early, if that is the crop to be raised, to deferring it to the latter end of May. It would be less inconvenience and loss to lose some of the wheat by the insect, than lose the grass seeds, and have the disappointment consequent thereon. Indeed, it is very questionable whether it is a good plan to sow grass-seeds and clover with wheat, if a good crop of wheat is desired. The young grass and clover growing up about the wheat, is a shelter for the wheat fly, and in wet seasons retains more moisture about the straw than is beneficial to the crop, and is apt to induce rust. When wheat is sown in drills, and hoed, as in England, they can seldom sow grass or clover seed with it, and hence land is not often seeded down for grass with wheat in a good system of husbandry, when a regular rotation is observed. There is certainly a difficulty here in regard to this matter, and we fear that wheat must continue to be the chief crop to sow grass seeds with, but in that case it may be advisable to sow early, so as to give a fair chance for the grass and clover seed. This year, from all reports we have heard, the early and very late sown wheat has been less injured by the fly, than that sown from the 25th of April to the 15th May. From our own past experience, we should have expected this to be the case. The wheat crop generally, so far as we have been able to ascertain, has not suffered much injury this year by the wheat fly, and will be a better crop than we have had for some years. A dry warm season, we have ever found, both in the old country and in this, to be most favorable for wheat. It is said that summers of the highest general temperature, always produce abundant crops of wheat in England, as this high temperature is usually accompanied with dry weather. On the con-

trary, a low temperature is generally accompanied by a wet season, and is invariably productive of inferior crops of wheat, both in the British Isles and in Canada. A dry season saves much labor, and prevents waste and injury to crops. In this latitude, we are not often liable to extraordinary or injurious droughts, and the driest seasons we have seen in this country, have been the best for the farmers. There are some complaints of their crops of wheat, occasioned by various causes, but this may be always expected until draining and better cultivation is more generally introduced. In many places last Spring, the lands were not in the best condition for sowing or producing a good crop. They continued wet to a late period, and before they were fit to sow, the soil became so excessively hard, that it was impossible to harrow them sufficiently to form a good seed bed for the grain to vegetate in, and much of the seed failed from this cause. The same causes exist every Spring in a greater or less degree, and have been productive of similar results to those we have stated. We hope, however, we are correct in reporting very favourably of the crops generally, and an early harvest, as this undoubtedly is, is a most certain proof that the crops are better than they would be of a late harvest—at least we have ever found it so. In Lower Canada we have not had any sprouting of grain in harvesting up to this time, and this is a great advantage.

To harvest beans so that they will keep in good condition, is very difficult. In England they put a funnel in the centre of the stack to give a free circulation of air, and this prevents any injury to the beans, and admits of their being harvested much sooner than they could otherwise be. The funnel is sometimes made of cast iron, but generally of three poles of wood joined together with small spars, nailed on at about a foot apart. Where there is a sand, the funnel is placed upon the frame in

the centre of the stack, and the stack is built round them. Where there is no stand, there may be a channel formed of stone, or of wood under the bottom of the stack and the funnel placed upon. The air would go through this opening and through the funnel in the stack; and keep the beans from heating or injury.

Upon the whole, we can safely state, that we have not seen a crop of grain this year that was not fully as good as could be expected in proportion to the state of fertility, cultivation and management of the soil for the crop, and what more could reasonably be expected, unless crops were to be produced without any cultivation for them. We have seen and heard of symptoms of the potato disease appearing in the stalks or vines of the potatoes; but we believe that the tubers are not yet affected, and should dry weather continue, we may hope that the potato crop will escape the disease. We do not expect that in this dry weather the crop will be very large, but a moderate return of sound potatoes is much more desirable than a larger crop of potatoes that would be unsound. Farmers who are anxious to grow large crops of potatoes would be likely to incur loss instead of profit. Early planting will be the best security against disease, and making use of special manures, rather than farm-yard manure. We have no doubt that potatoes may be grown but not by the same cultivation and manuring that was practised successfully before they become diseased, and by the cultivation and manuring that has produced the disease. We have never seen the vines of the potato crop look more luxuriant than they did this year. The vines may wither and dry without disease affecting the tubers, but after this takes place the tubers will not increase much in size. There is a general complaint this year of the failure of the turnip crop by the fly, or at least seed that has been sown two or three times has been as often eaten by the fly the moment

the plants have appeared. This is a great annoyance and disappointment to a farmer, and one that we are very liable to in this country. It is most essential that soil for turnips should be well pulverized, and finely broken down—that it should be moist when sown—that it should be limed with about 40 bushels to the acre, previous to drilling, or sowing, broad cast—that special manures, such as guano, bone-dust or ashes, should be applied instead of farm-yard manure, or applied with the latter—that a rapid vegetation of the seed should be obtained if possible—so that the plants may soon come into the rough leaf. Moist or peat soil is less liable to the fly here than upland or sandy soil. When the weather is dry at the time of sowing and for some time subsequently, the young turnip plants are very liable to be injured. In England it is found that by mixing the Swedish and White turnip seed, the fly will destroy the White, and the Swedish will escape with little damage. The experiments are worth trying. Turnip seed is not expensive, and by sowing some extra seed of a different kind from the variety sought to be raised, and of the kind the fly prefers, it would not be difficult to hoe out any that remained after the danger of the fly was passed. There is no better variety of turnip for food for animals or for keeping during the winter, than the Swedish, and we believe they might be grown by careful cultivation, and adopting the precautions we suggest. Steeping the seed of the variety of turnip desired to be grown in train oil, and drying it with sulphur, would also be a good plan, and only steeping the seed sown to feed the fly in soft water. The latter should be done in order that the plants would appear as soon as the plants from the seed steeped in oil. It might also be proper in case of steeping in this way that the seed should be sown separately, that for the food of the fly on the sides of the drills. This method would

give additional trouble certainly, but perhaps would not cost much over a dollar the acre, and this would be amply compensated by having the first sowing safe and in time.

There is a greatly increased quantity of Mangel-wurtzel, Carrots and Parsnips sown now in Lower Canada, over what was sown heretofore, and this is a certain indication of improvement in our husbandry. We do not expect that root crops will ever be cultivated here in the same proportion to grain crops that they are in England, but it would be very desirable that every farmer should cultivate some. If it was possible the land should be manured the previous fall and well drained. This would keep the soil open, and it could receive all the working it would require in Spring as soon as the snow and frost was gone, and the seed could then be early sown, which is most essential to good root crops. If our lands are not well prepared in the Fall, so as to keep them as dry as possible, and drained, so that the water shall pass off of them in the Spring without obstruction, we cannot sow in time or expect good crops. The growing seasons are very short the most favourable years, and we should certainly strive to be prepared to give our crops the whole benefit of the growing season. How can we expect good crops if we do not sow until mid-summer? With the exception of turnips, and buck-wheat, there is not a crop cultivated by the farmer that should not be sown in April and May, and as early as possible in these months. As to the wheat, we would not take upon us to recommend early sowing for all, least the fly should damage it, but we would have no hesitation to sow early if the land was in a fit state. As we before observed the most dangerous time is—sowing between the 25th of April and the 15th of May, and we should, prefer in our own case to sow previous to the first, or subsequent to the last of these periods. Oats, peas, and potatoes, cannot be sown too early after the

land is fit. Barley should not be sown before the weather becomes fine. We have never seen a good crop of barley when the sowing has been immediately succeeded by a very heavy fall of rain, unless the land was very dry indeed, or thorough drained. In England they endeavour as much as possible, to check weeds in the Fall, by destroying their roots, so that they shall not be in the soil to sprout and grow in Spring before or with the cultivated crops. Here, on the contrary, we make no effort to check the growth of weeds in the Fall, and consequently in the greater part of our lands, they must be continually on the increase. By summer fallowing, well, and properly executed, weeds might be effectually destroyed. Any farmer might summer fallow eight or ten acres in the year, if he would resolve to do so, and the whole farm might soon be got over in this way, and be put into good condition. We do not see how anything like a regular rotation of crops can be established here, without introducing summer fallow. Ten acres treated in this way, might be seeded down with clover and grass, for meadow, and it would then be in a clean and productive state, until it would be required for ploughing again, when it would be clean for any crop to be sown in it. There is an objection made to summer fallow by parties who pretend it is an unnecessary waste of land for a year, and contrary to the principles of good husbandry. However this objection might have weight in the British Isles, we do not consider that it applies here, where so large a portion of the lands is left in nearly a state of waste every alternate year. There is another objection urged, that in our hot summers, the fertility of the soil is evaporated by exposures to the sun in a ploughed state. This we conceive is a great mistake. Any farmer may see, that in the driest periods of the summer, by stirring the soil about the plants of green crops, an immediate improvement will be observable in

the plants. Ploughing and working the soil in summer, instead of exhausting it, causes it to attract fertility from the atmosphere, from whatever cause it may be, greatly adds to its fertility, and its fitness and capability for producing a good crop.

The very dry weather we have had in August, although favourable for harvesting has had a considerable effect upon the late sown crops, in hastening them to maturity, we fear, in many cases, rather prematurely. The grass and pastures have been very much dried up, and will not recover, until there is a considerable fall of rain. The markets are well supplied with meat—butter, and cheese, the latter of better quality than usual, and much of it of Canadian manufacture. This is as it should be. We might make butter and cheese here for exportation to a large extent, and it would pay well. Suitable dairies, good dairy-maids, skill, attention and cleanliness, are the grand requisites to insure good butter and cheese. It will not do to make good butter and cheese one time, and not another, as this will destroy the character of all. The most careful attention is to be observed constantly to secure a regular good quality at all times. In conclusion, we have abundant cause of thankfulness to a Bountiful Creator, "Whose goodness does the circling year" "With fresh returns of plenty crown!" and for giving us a healthy season. These, the greatest of all earthly blessings, are enjoyed by the farmers of Canada in as great a degree as those of any country on earth, in every instance, where they perform their own duty properly.

August, 27th. 1850

We are glad to perceive that the County of Terrebonne Agricultural Society have adopted the plan of paying all Premiums awarded for well managed farms, at their cattle show, ploughing matches, &c., "in useful and improved Implements of Agri-

culture,—superior breeds of young male animals—different species of grain, and any other useful article for the advancement of agriculture." If this mode of paying Premiums was generally adopted, it would have a good effect, provided always, that the Implements are of a good description and suitable for the use of the parties who obtain them. There is also, great caution to be observed in the selection of animals, that they may be good, and suitable for the use of parties to whom they might be awarded, or it will not be satisfactory to the parties obtaining them. As regards samples of seed there is no difficulty, except that they be clean, and of unmixed varieties. Awarding choice male animals will be the most difficult matter to manage, first, in obtaining suitable ones, at a fair price, and then in giving satisfaction to the competitor to whom the animal is awarded. This may all be provided for by Regulations of the Society which we have not seen. There is a numerous list of Premiums, and no less than 12 for well managed farms all of them open to Canadian farmers, and only 6 of them open to other than Canadians. There are no Premiums offered calculated to do more good than those for well managed farms, under judicious regulations and restrictions. We humbly conceive that it is very objectionable to allow parties to compete for different crops, and for well managed farms at the same time, and to be awarded Premiums for both. This is not allowing competitors a fair chance, and appears very like the "prize catching" system, that should be prevented if possible. If a good crop of any kind happens to be growing upon a farm that obtains a prize for being well managed, this good crop is a part a part of the result of good management and is not we conceive entitled to a separate premium. We do not see what is to prevent the best managed farms to obtain all the prizes for crops also, and cut out all other

competitors. If a farm be generally well managed it is probable that each crop upon it will be good, or at least better than any crop growing upon an ill-managed farm. These matters require consideration to maintain the character of Agricultural Societies, and their general usefulness and popularity. Any farmer obtaining an award for having the best managed farm should be perfectly satisfied with that honour, and leave other Premiums to encourage parties that are less fortunate and probably less skilful. We should be sorry to propose anything unreasonable but we feel persuaded the more general the competition that is allowed by the regulations of Agricultural Societies and the more widely the Premiums are distributed to farmers, the more useful their action will be, in encouraging improvement. The County of Terrebonne Cattle Show is to take place at the Village of Ste. Thérèse de Blainville, on Wednesday the 25th September instant.

An attempt has been made in July last by the County of Montreal Agricultural Society to establish a Fair, and a considerable number of animals were upon the ground, (the Old Race Course, Mile End,) for sale and for show. We did not hear whether many sales were effected, but we hope the Society will persevere in their intention of holding another Fair in the Fall. The month of May would be the most suitable period for the Spring Fair, and, perhaps, early in October, for the Autumn Fair. It would be a great convenience to farmers and others who require either to sell or to purchase animals, to have regular Fairs, as in the Old Countries. A variety of animals would be brought together for selection from to suit all parties, and much time would be saved. The Montreal Market is a very uncertain one to sell or purchase store animals in, and a larger portion of the animals exhibited are the greatest trash ever offered for sale.

We willingly give insertion to the communication of Charles Treadwell Esq., which will be found in another column, and we recommend its perusal to subscribers. When a provision has been made by the Legislature for representing Canada at the great exhibition in England next year, every thing should be done to make this representation creditable to Canada, as it certainly might be. We have always thought it would be well to encourage the writing of Essays on different subjects referring to the Capabilities, Agriculture, Manufactures, Commerce, &c., of Canada, and we should rejoice to see encouragement held out to write Essays on all these subjects. The Royal English Agricultural Society apply a considerable amount annually to this purpose (£300). There are 4 Essays annually for the best on the Agriculture of four several counties, and by this means they have now published Essays, we believe, on more than half of the English counties, and these Essays contain the most valuable information and instruction. They offer £50 sterling for each Essay that is considered the best. Were prizes offered here on the same plan, they would be productive of much good. It would not be necessary that we should have one for each county. One would be sufficient for each section of the Province. The application of public funds to these purposes, would not be mis-applied, but on the contrary, would give the true state of all matters to which they would have reference, and this information would be of the greatest advantage in developing the resources of the Province.

We have received from B.D. Johnson Esq., Secretary of the New York State Agricultural Society, the transactions of that Society for the year 1850. It is neatly bound in cloth, contains nearly 1000 pages of interesting and useful information, and several well executed Illustrations. It is altogether exceedingly well

got up, and highly creditable to the Society, and to their Secretary, Mr. Johnson who has prepared the work as Editor of it. The Lectures of Professor Johnson, delivered last year when in the State of New York are all given, and add greatly to the value of the work. We shall avail ourselves occasionally of the "Transactions" to copy what we conceive may be interesting to Canadian farmers. We beg to return the thanks of the Lower Canada Agricultural Society to the New York State Agricultural Society, and to their worthy Secretary, Mr. Johnson for their "Transactions."

The District of Montreal Cattle Show we believe is to take place at St. John's on the 9th October next.

We did not receive any notice of it, but accidentally saw the advertisement in the *St. John's News*.

The following we copy from the *Albany Cultivator*, for May last, under the heading :—*Improvement in Connecticut*—Farmers in Canada, may, if they can, produce such returns as it is reported they do in the United States. We confess we have never seen any equal to them in Canada yet :

"Our grass lands, lying in the vicinity of our main street, produce on the average, four tons to the acre, both crops (we always cut two crops per year); one field that was actually weighed, produced over five tons to the acre; and there are others which will equal that. There were 3 acres of oats averaged 86 bushels per acre, one acre of which being limed produced 92 bushels. Of corn one single acre produced 136 bushels, a piece of 3 acres produced 116½ bushels to the acre, weighing 60 lbs the bushel; another piece of 6 acres, produced on an average 102 bushels per acre. * * We can show cows from whose milk at grass alone, 2 lbs. butter per day are made." A cow is said to have produced £25 12s. 6d. in the year by her butter, and a calf sold for 6 dollars, the quantity of butter produced was 368 lbs. "Large Farming in the West," James Davis of Waverly, Ross county, Ohio, cultivat

1800 acres exclusively in Indian-corn, and had last winter, a corn-crib filled, which was *three miles long*, ten feet high, and six feet wide. It is stated further, that on the Great Miami Bottom, about 25 miles below Cincinnati, there is one field, (belonging to several owners,) seven miles long by three miles broad, which has been regularly planted to corn for nearly half a century. In the Wabush Valley, there is a corn field ten miles long.

These are surely surprising statements, and it would be worth a journey of even 1000 miles to go and see how a farmer in the West, where labour is scarce and dear, can manage to cultivate and harvest properly, one two or three thousand acres of Indian-corn. We have noticed other products, of potatoes for instance, and we believe that the quantity reported would more than cover the whole surface of the land, they were grown in. We have certainly better land in Canada than we have ever seen in the United States; but our products are awfully behind.

ON SAXONY SHEEP.

PERFECTION should be the aim of all; and as the Saxony sheep have been brought to the highest state of perfection, as producers of extra fine wool, it is my desire to make the description so plain that a young wool grower, who observes these rules, in buying or selecting for breeding, will soon have a good flock.

First comes the description of a pure blood Saxon buck. He should be of a medium size; (and I consider a medium sized buck to be 3 feet 9 inches from the nose to the root of the tail,) around the body 3 feet 2; around the flank 3 feet 6; from the breast to the hip 2 feet 6; in height 2 feet 3; he should be a little longer than a Merino, and not quite so heavily built. The back almost straight; broad over the kidneys; body round; the neck starting almost level with the tops of the shoulders; tapering and becoming round towards the head. The head small and neatly set on; no loose skin on the upper part of the neck, or very little; the hoofs short and pointed; well quartered, strong, active and spirited; his eye bright; pleasant countenance and tame; the skin smooth and healthy looking. When walking with his side to you, he should look finished and gay. He should look and feel woolly not stiff nor hard, but soft. The same rules should be observed in selecting ewes, only they are a size less.

The next comes the description of his wool. Fine wool on his forehead; wool on his crown, fine, short; downy looking wool on his cheeks; the under part of the neck as fine as possible, and crimped. The wool on the body to be as even as possible all over, and should be crimped 24 to 28 crimps to the inch; the crimps should run plain and evenly across the sample, and up to the top, resembling crape. It should be fine, soft, thick set or compact on the sheep; should be so that it will stand straight out, showing small strands or divisions on the surface of the fleece; the belly well covered with fine wool; the hip wool soft and crimped. The wool should be a clear white or cream color; moderately yolky, and the surface of the fleece a little dark. There is a very good kind of wool, that is very fine and close, in which you cannot trace the crimps—you must decide by the smallness of fibre. The fleece when shorn, its felting properties should keep it united; when spread, resembling a spider's web; it should be soft and easy rolled: the length of wool after it is washed and shorn, is from 1.12 to 2 inches.

When a young wool grower goes to select he should keep the above described sheep or some other model sheep before his mind; it would help him to have precisely one-fourth of an inch marked on his thumb nail, to lay the sample on and count, and if they count six or seven crimps in that space they are very good. You should cut the sample with scissors, for pulling them injures the wool and the sheep both.

When the wool is well crimped, it is superb. Sheep that are soaked and washed under a waterfall until the wool is pure and clean, will average 2 1-2 lbs. per head—if washed in the old way, they will average 3 lbs. You can have your sheep exquisitely fine, or fine and heavier fleeced, just as you select them to breed from.

Remember, 'like begets like.' Be careful to guard against the following faults: Coarse, hairy faces; coarse hairs or uncrimped wool on the under part of the neck; stringy on the top of the shoulders; bareness of the belly; coarse hip wool; and coarse hairs on the inside of the thighs; the skin pale or covered with spots; slab-sided, poor on reasonable keeping; sunk, in the neck; a little coarse; low on the side.

In conclusion, try to have your sheep with as many of the good marks as possible, and very few of the bad ones. Annually select, fatten and sell faulty sheep to the butcher. By so doing, you will have the profit and pleasure of having a fine and beautiful flock.

MECHANICS.—Of all the branches into which Natural Philosophy is divided, mechanics have proved the most useful to agriculture. No doubt any labourer may work any machine that answers the purpose it is constructed for; but

without a knowledge of this science he cannot understand the *principles* upon which any machine is constructed, nor can any machine be properly constructed but in accordance with those principles. As implements may be characterised as the right hand of agriculture, mechanical science, in improving their form and construction, may be said to have given cunning to that right hand; for, testing the strength of materials, both relatively and absolutely, it employs no more material in implements than is sufficient to overcome the force of resistance, and it induces to the discovery of that form which overcomes resistance with the least power. Simplicity of construction, beauty of form of the constituent parts, mathematical adjustment, and symmetrical proportion of the whole machine, are now the characteristics of our implements; and it is the fault of the hand that guides them, if field-work is not now dexterously, neatly, and quickly performed. In saying thus much for the science that has improved our implements to the state they now are, when compared with their state some years ago, I do not aver that they are yet perfect; but they are so perfect as to be correct in mechanical principle, and light in operation, though some are not yet simple enough in construction. Many indeed may yet be simplified in construction; and I consider the mechanist who simplifies the action of any useful implement, thereby rendering it less liable to derangement, does as good service to agriculture as the inventor of a new one. Such a result may at all times be expected; for mathematical demonstration is strictly applicable to mechanics, whether to the principles on which every machine operates, or the form of which it is constructed.

Were mechanists to pay more attention to principles, and less to empirical art than they commonly do in several districts, implements would soon assume the form most consonant with the demonstrations of science. As it is, modifications of construction and unusual combinations of parts are frequently attempted by mechanists; and though many such attempts issue in failure, they nevertheless tend to divulge new combinations of mechanical action. It is desirable that every mechanist of implements should understand practical agriculture, and every farmer study the principles of mechanics and the construction of machines, so to their conjoined judgment and skill might be exercised in testing the practical utility of implements. When unacquainted with farming, mechanists are apt to construct implements obviously unsuited to the work they are intended to execute; so that having been put together after repeated alterations, and probably at considerable expense, the makers endeavour to induce those farmers who are no adepts at mechanics to purchase them, and after some unsatisfactory attempts

they are put aside. Were farmers acquainted with the principles of mechanics, their discrimination would form a barrier against the spread of implements of questionable utility, and only those find circulation which were obviously simple, strong, and efficient. It is not easy to invent implements possessing all those desirable qualities; but, as they are always exposed to the weather, and the soil is ponderous and uncouth, it is necessary they should be of simple construction. Simplicity of construction, however, has its useful limits. Most farm operations being of themselves simple, they should be performed by simple implements; and all the *primary* operations, which are simple, requiring considerable power, the simple implements should also be *strong*; but complicated operations, though stationary, require to be performed with comparatively complicated machinery. Operations that are both complicated and locomotive should be performed with implements producing complicated action by simple means, in order to avoid derangement of their constituent parts. The solution of this last is a difficult, if not impossible problem, in practical mechanics. The common plough approaches more nearly to its practical solution than any other implement; yet that wonderful implement, executing difficult work by simple means, should yet be so modified in construction, as to give the ploughman a greater command over its motions. These considerations tend to show, that the form and construction of implements, and the circumstances in which they may be used, are still subjects affording scope for mechanical contrivance.

In viewing the construction of all machines, an important circumstance to be considered by the pupil is, the resistance among moving parts which arises from *friction*; and in solid structures, generally, the forms and positions of parts have to be adjusted to the *strength of materials*, and the strain which the parts have to bear. This consideration should lead the pupil to become acquainted with the strength of materials; and, as a farmer, he will have much need to put such knowledge in practice when he comes to receive the work executed by the carpenter and smith.

On considering machines, he should also avoid the common error of supposing that any combination of machinery ever can increase the quantity of power applied. "What an infinity of vain schemes—yet some of them displaying great ingenuity—for perpetual motion, and new mechanical engines of power, &c.," exclaims Dr. Arnott with reason, in his *Elements of Physics*, "would have been checked at once, had the great truth been generally understood, that no form or combination of machinery ever did, or ever can increase, in the slightest degree, the quantity of power applied. Ignorance of this is the hinge on which most of the dreams of

mechanical projectors have turned. No year passes, even now, in which many patents are not taken out for such supposed discoveries, and the deluded individuals, after selling, perhaps, their household necessities to obtain the means of securing the expected advantages, often sink into despair, when their attempts, instead of bringing riches and happiness to their families, end in disappointment and ruin. The frequency, eagerness, and obstinacy, with which even talented individuals, owing to their imperfect knowledge of the fundamental truths of mechanics, have engaged in such undertakings, is a remarkable phenomenon in human nature."

TO TAKE HONEY FROM BEES.

SIR—As I read in one of your late papers a query respecting the way to take honey from bees, without smothering them, and as I think that a successful way of doing so is very easy for every bee fancier to undertake, I wish to let you know the plan which I always adopt, and which if you think worth a place in your paper, you are very welcome to.

The simplest way, and the one by which I invariably take the honey away, is, I provide, in the proper season, a kind of fungus, which grows in old grass lands (we call them puff-balls,) and having carefully dried them in an oven, I put them in a paper bag over a fireplace, to keep them dry until wanted. I also have a tin box, five inches square, with a very close-fitting cover; and soldered to each end of this box, I have a small tube about six inches long; when I wish to take the honey away, I place my hive on a board or flag, and having lit four or five of the puff-balls, I put them in my tin box, and cover it *close*. I then insert the end of one of the tubes that are fixed to the box, under the rim of the hive, about two inches in. I place them in a damp cloth round the bottom of the hive, to keep in all the smoke, I then blow gently through the other tube. The smoke of the puff-balls will, by this means, be driven from the tin box, through the other tube, into the hive; in a short time the bees will become quite intoxicated, and fall from all parts of the hive on the board or flag on which the hive is resting; I have ready at hand another hive properly dressed with sweet cream, which I place over them after I remove the full hive; they will, in a short time, recover, and ascend to the top of the hive. I then remove them to their permanent stand. I have tried ether, but it is so very difficult to ascertain the quantity of ether to administer, or the time to withdraw the vapour, before a number of the bees are destroyed, that I have invariably used the puff-ball in all my experiments.

By the use of the puff-ball I can join two weak stocks, and make *one strong one*, which is of more value than a dozen weak ones; the way I do so, I will at a future time be very happy to communicate to you, but at present I fear I have

trespassed too much on your valuable time.—
Yours, &c., JAMES KINGSTON, *Lowertown Lodge,*
Skull, June 3, 1850.

WAGES, AND WORK IN THE TIME OF MILTON.
The wife of Milton hired a little boy that was glad to receive three pence a week. His employment was to fetch the milk, post the letters, get flour from the mill, and barn from the brew-house, carry pies to the oven, clean boots and shoes, bring in wood, sweep up the garden, roll the grass, turn the spit, draw the water, lift boxes and heavy weights, chase away beggars and infectious persons, and any little odd matters of the kind.—*Selected.*

DISEASE OF FEET IN CALVES.

“We lost a great number of calves for some years past by a disease they took about the feet; their hoofs grew so fast and so soft, that they could not walk with them, although I pared them now and then—and I have one this year, that has the same disease. I was advised to rub vitriol to the diseased part, which I did. I cannot say yet whether I can cure it or not, but I see that the disease is not making such rapid progress since I began to apply the vitriol to it. Perhaps when you are going your rounds, you will call at J. & R. Raimes, who sell medicine for sheep, and ask them if they sell what is applied to the disease called the ‘rotfoot in sheep.’ I think that the disease in the feet of the calves is something of the nature of the rotfoot in sheep.”—S.

“I am much indebted to you for the trouble you took in inquiring about the calf. There is nothing putrid or broken about the feet, or hoofs, but the hoofs grow uncommonly fast, and are soft where they become attached to the skin, but quite hard towards the point, and if not pared would turn upwards; if any thing they are harder than usual, so that the calf does not lay his weight upon the point of the hoofs as other calves do that are not troubled with this disease. When he is going he stretches his feet forward, and lays his weight upon the back part of the hoofs as if a person were walking upon his heels. So far as I can judge from the experience I have gotten about the disease, it arises, or is caused, by the over-growth of the worm that lies between the hoofs, for I suppose that you, and particularly Professor Dick, are aware, that in every beast's foot, with divided hoofs, there lies a worm in the fore or upper part where the hoofs divide from the legs, which is always taken out by those who prepare the feet for human food. Although the said worm is naturally but the size of a small bean in a calf, yet it grows to such an enormous size that it goes back through the feet until the end of it lies close to the skin in the hollow part between the small hoofs at the back of the feet. In some of the calves that

had the disease, I saw the end of the worm, which moved to the touch, and appeared to come from the direction in, or through the foot where the above mentioned worm lies, and I took an awl, put it through the end of the worm, and drew it out as far as it would come, then burnt it off with a red hot iron, as close to the feet as I could, without coming in contact with the sinews, &c., and that without curing the disease. One of my neighbours told me that he cured two calves by an advice which he got, viz., first rubbing vitriol to the hoofs, then whale oil to keep the vitriol from burning the feet. I did that to one I had last year: it stopped the disease, but the vitriol destroyed the joints close to the hoofs, so that the calf died, but I am more cautious in using the vitriol to this one. It checks the disorder, so that it is not making such progress, but it does not appear to remove it. I am using the vitriol as advised by the Professor, and will do so till I hear from you again. There are various reasons given as the cause of bringing forward the disease; some say that it is caused by the calves lying on hot dung, but that cannot be, for no dung will heat while beasts are trampling upon it. Others say that it is caused by their lying on wet dung, but we generally keep them dry—at least as dry as we were wont to do before the disease was known in this quarter. A third party says that too much running will cause the disorder; now the calves all run a good deal when they get out first and the one I have diseased took the lead among the calves when they first got out, and certainly ran a good deal; and I never saw two calves that ran so much as the first two that took the disease with us about 20 years ago. They would run almost the whole day through the arable land, and it is shortly after they get out first that the disease makes its appearance. I may say in conclusion, that the diseased one this year is of the same cow as the one previously affected.”—S.

[Remarks.—It appears to me that the disease in the feet of your brother's calf is very like what we call founder which is an inflammation of the sensitive laminae of the foot around the sides and toe. The softening may either be an effect of it, by causing a throwing out of a soft porous horn in great abundance, or the back parts of the feet are softened by the calf resting on the soft wet dung. I think the best thing that can be done is to have the toes or fore parts of the hoofs, pared down almost to the quick; indeed, even if the quick were exposed and bled a little when the disease first appeared it would do good, poultices of bran may be of much use; but, in the case you now mention, which has been going on for a length of time, they are not likely to be of much service; and after paring down the hoofs sufficiently, a solution of any mild caustic, to act as an astringent will be the most likely remedy. If the sulphuric

acid he is using is diluted with five or six times its weight of water it will do; or he may dissolve an ounce of sulphate of copper in a quart of water, and try it; if necessary, the feet may be wrapped, inclosing a little tow and tar; but the main thing is to pare the hoofs properly and in that case it will perhaps be found that the calf can walk quite well, and may be turned out into good dry pasture.—W. D.]

Water for cattle.—The Professor commenced this third head of his lecture by remarking that he believed it was a generally observed fact, that cattle liked the water of ponds, while they disliked that of limestone springs; that they preferred to quench their thirst in a green offensive collection of stagnant water, rather than in a running spring. In Bedfordshire he had seen cattle much relish a bad water filled with confervæ and animalculæ, which, however, was the only water to which they happened to have access. Farmers generally supposed that the cattle were fond of such water on account of the green, vegetable matter it contained; and a distinguished professor had explained the fact by supposing such water to be “meat and drink” for the cattle. It was certain they did not like hard water; and it gave a staring coat for horses when they were obliged to drink it; and when it was considered that water, in chalk districts, contained from 60 to 70 grains of carbonate of lime in the gallon, while London water (which was hard compared to others,) contained only from fifteen to sixteen grains, it would be obvious how much difference would be found to exist in different waters. He regarded a good supply of water essential to health; and thought it a point of great importance to ascertain the kinds of water most suitable to the animal economy, under different local circumstances. Professor Way concluded his lecture by expressing a hope that the members present would communicate to the meeting such cases of the practical effects of hard water, on the health of cattle, as it had been his object in the remarks he had then made, to elicit from them.

CIRCUMSTANCES WHICH MODIFY THE QUANTITY OF LIME THAT OUGHT TO BE ADDED TO THE LAND.

There are many circumstances, as I have said which will modify the quantity of lime that may most profitably be added to the land. Thus—

1°. *The nature of the soil* must be considered.

a. A light, sandy soil must not be so heavily limed as a stiff clay. This is a familiar fact to every farmer. Besides those purposes which the lime serves in the lighter soil, it is applied to stiff clays with the view of opening and rendering them more friable and mellow. This of course

requires the presence of an additional quantity. In a clay soil, also, the minute particles of lime are apt to become coated over with a thin layer of impervious clay which prevents many of them for a long time from exerting their full effect in promoting the growth of plants. For this reason also, a larger proportion is useful. Lastly, lime cannot be diffused through a clay soil so easily or so completely as through a light or sandy soil, and therefore it must be added in larger quantity, in order that it may be made equally accessible to the roots of plants.

Hence in the same neighbourhood, as in parts of Renfrewshire, where 2 or 2½ tons are considered enough for the hill-side (sharp or gravelly) land, 6 to 8 tons are considered indispensable on the heavy land of the bottoms.

b. Such again, as are poor in vegetable matter will bear less lime than such as are rich in decaying animals and plants. One of the uses of the lime is to combine with substances which are naturally produced during the decay of vegetable matter in the soil—the larger the quantity, therefore, of the dead roots and other parts of plants, the greater will be the demand for lime to perform this function. Besides, as dead plants afford the food on which new races of plants live, and as lime promotes the decay of the former and the preparation of the food they contain, it must be advantageous to the immediate fertility of the soil to add lime more abundantly when much vegetable or animal matter exists in the soil.

Still all soils, in which vegetable matter abounds will not bear in an equal degree the application of large doses of lime. Our dry, moorish heaths, covered with a black vegetable mould of a few inches thick, resting on a gravelly subsoil, often give excellent crops of oats, and even turnips and barley, when first broken up and limed, but afterwards become too light and open to grow oats and clover successfully. To such soils lime should not be added too lavishly; and means should be taken, by deep ploughing or otherwise, to mix up and solidify the surface soil, that it may contain on the whole a smaller per centage of organic matter than the few inches at the top usually do in their natural state.

2°. *The state of the soil* is also of great consequence. If the land be wet and undrained, a larger dose of lime must be laid on. The moisture, like the coating of clay above referred to, shuts out the air, and prevents the lime from having its full effect. The coldness of such soils also checks the decomposing action of the lime upon the soil, and causes the production of a larger proportion of acid matter—for both of which reasons more lime is required. Further, in wet land a portion of the lime not unfrequently forms insoluble compounds—mortars, silicates, &c.—which do not act in the usual way in bene-

fitting the crops, and thus also larger applications are rendered necessary.

If the soil be a stiff clay as well as full of water, then larger doses still be required; and if it be also marshy, and therefore abound in vegetable matter, very large applications of lime must be laid on, in order to obtain the full benefits it is capable of producing.

3°. *The kind of cropping* is also of consequence. Green crops are benefited by larger doses of lime than crops of corn. In reclaiming boggy land it has been observed, that while the addition of above a certain quantity of lime lessened the after-crop of oats, a turnip or potato crop, if taken first was excellent in proportion to the quantity of lime applied. A similar remark applies to the ploughing up of lea. If corn is to be taken, the liming may be postponed, but, for a green crop, lime will generally be advantageous. By land which is lying in grass, less lime will usually be required in the same number of years, than by an equal extent in arable culture. Much, however, will depend upon the way in which the grass land is treated; and if it is cut for hay, more of course of everything, and of lime among the rest, will be required than when it is kept in permanent pasture.

4°. *The kind of husbandry followed*.—An improving husbandry, for example, will call for larger applications of lime. If, as means of improvement, the land be ploughed deeper, the lime will be diffused through a greater body of soil, and should therefore be present in greater quantity. Or if the land be drained and sub-soil-ploughed, with the view of removing noxious matters from the deeper soil, and of allowing the roots to descend, a more abundant liming may in the first instance be required—since it is desirable that some of it should find its way into the under soil, to aid in preparing it for the safe descent of the roots of the growing crops.

5°. *The form in which the lime already present, exists in the soil* is also a matter of much importance. The soil may contain 6 or even 10 per cent of lime in the state of silicate, and yet pay for the addition of a considerable first dose of *quick-lime*, because this silicate must itself undergo decomposition, through the joint action of air and moisture, before it can produce the good effects which follow from the use of lime. A reasonable per centage of gypsum may also be present, and yet the land may pay for liming; because the gypsum is not fitted to perform all the functions of quicklime, or of carbonate of quicklime, or of carbonate of lime in the soil. In this latter case, however, much will depend on the nature of the soil itself, on the kind of manure applied to it, and on the circumstances in which it is placed—points to which I may hereafter have an opportunity of adverting.

6°. *If the land has been previously limed*, a larger quantity is believed to be necessary to produce an equal sensible effect compared with that

produced by the first addition. This may arise from several causes.

a. If the land be nearly destitute of lime when the first application is made, a very remarkable effect will necessarily be produced, since a certain proportion is necessary to the ordinary fertility of the land.

On a second and third application, the land already contains more lime than at first; and therefore a larger quantity must be added if it is to come in contact with as many particles of soil on which it can act, as the first lime readily reached.

b. For instance, the whole quantity of that kind upon which it can readily act, may be less than it was on the first application; and hence the lime must be diffused through it in larger proportion, if it is to be brought in contact with as much of this vegetable matter, and produce as great a sensible effect as at first.

c. But the good farmer will not often expect to see upon his old-cultivated land a sensible effect produced by lime equal to that which is seen when it is newly brought into arable cultivation; the addition of lime from time to time, in good husbandry, being made rather to *keep up* the existing condition of a productive soil, than to add materially to its actual fertility. This point will be more fully discussed in a succeeding article.

7°. *The geological character and structure of a country* have also much influence upon the quantity of lime which its soils require; but this point is of so much interest and importance that it will be better to consider it in a separate section.—*Johnson's Treatise on Lime.*

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AND

TRANSACTIONS

OF THE

Lower Canada Agricultural Society.

VOL. 3.

MONTREAL, OCTOBER, 1880.

NO. 10.

We very willingly give insertion to a letter of Mr. Wm. Boa, and in reply to his enquiry beg to state, that in our Treatise on Agriculture, published under the heading, "Agricultural weights and measures," in 1835, we gave the various Land Measures, by which land is measured in England, Ireland, and Scotland, and in Lower Canada; and also, the various "Corn Measures," known in all these countries, and the proportions they bear to each other. We have at various times since that period, endeavoured to draw attention to the great inconvenience of having different weights and measures in this Province for selling grain of all kinds. Our measure differs from Upper Canada, and both differ from the Standard measure of England, the Imperial bushel. But to proceed to reply to Mr. Boa. The English foot is 12 English inches. The French or Canadian foot is $12\frac{7}{10}$ English inches, 100 English feet is equal to $93\frac{9}{10}$ French or Canadian feet. The English acre is 4840 square yards. The French or Canadian arpent is 3600 square yards, French or Canadian measure, equal to about five-sixth of an English acre, or 100 English acres, make about 119 arpents, Canadian. This is as near the proportion as necessary.

As regards "corn measure," 25 minots Canadian, make 28 Winchester bushels all but 3 quarts, and about 27 Imperial bushels. Consequently, if one arpent produces 25 minots, an English acre should produce $29\frac{3}{4}$ minots, and hence one arpent producing 25 minots is equal to one English acre producing about 33 Winchester bushels, or about 32 Imperial bushels.

This calculation is as nearly correct as is necessary to give an idea of the proportions of each measure of land and grain. 300 minots of potatoes off an arpent, is equal to 400 bushels off an English acre in Upper Canada or the United States. This difference is a very material one in the produce of a 100 acres of grain in Upper Canada and the United States, and 100 arpents in Lower Canada. The land is nearly a fifth short of English measure in Lower Canada, while the grain measure is nearly a eighth more in quantity than the grain measure of Upper Canada or the United States. This difference is seldom duly considered in speaking of the produce of land in these countries, and when the difference is not understood, it gives an idea that is unfavourable to Lower Canada, compared with other countries. There are many other matters connected with Lower Canada that are not properly understood, and if they were, the country would be much more favourably appreciated.

To the Editor of the Agricultural Journal.

SIR.—In a late number of the Journal, you have given a statement of the difference of the capacity of the minot and the Imperial and Winchester bushels. Now that we farmers and our farms in Eastern Canada may appear in a true light in the eyes of our neighbours at the approaching Exhibition that is to take place in Montreal, will you in the October number of the Journal show the difference of the extent of the French and English acre. There are many amongst us that do not know that there is any difference either in the acre or bushel that is in use amongst our neighbours and that in use amongst ourselves; this ignorance of ours causes us to think too much of our neighbours, and lit-

tle of ourselves. Just be so good as to answer the following question, and you will oblige your humble servant and in some sense render justice to Lower Canada. If a French acre produce 25 minots, how many Imperial and how many Winchester bushels will one English acre produce.

Wm. Boa.

Virtue, Roadhead, September 27, 1850.

STATISTICS OF ENGLISH GARDENS AND PARKS.

NO. I.

At the request of several subscribers, we intend to give, occasionally, notices of some of the best gardens and parks in both England and Ireland. The Statistics of Scotch Gardens, &c., will be also continued as heretofore.

During a short tour recently made in the south of England, I had an opportunity of visiting the residence of Sir George Staunton, at Leigh Park, so justly celebrated for its selection of rare and valuable plants, and particularly for the perfection in which many of our rarest tropical fruits are cultivated. Nor should this celebrity be confined to that very important branch of horticultural skill, as everything grown appears to obtain an equal share of skilful attention, and to afford similarly satisfactory results. The residence itself does not form any very important feature, but it is delightfully situated in the midst of a thickly wooded and undulated country, about 10 ten miles distant from Portsmouth, enjoying a moderate share of elevation, it commands a considerable extent of view. The pleasure ground or demesne, in immediate connection with the house, consists of between 20 and 30 acres, and is most tastefully laid out in the gardenesque style—the irregularity of surface contributing largely to its beauty; not very distant from the mansion, there is point of sight from which a considerable portion of the ground is seen to great advantage. The eye of the beholder cannot fail being struck with the very handsome sheet of water which reposes in beautiful irregularity of outline below. The first conclusion the mind arrives at after drinking in the beauty of the prospect is, that it must be natural: but much to our surprise we were informed that it is all artificial, and, if we mistake not, has been made within the last few years. Be this it may, it is truly a most happy combination of Nature and Art—nay, rather it is Art so beautifully allied to Nature, that she has immediately claimed its work as her own. This sheet of water is of considerable extent, and is much enlivened by two neatly rigged vessels riding at anchor on its peaceful surface. In addition to this feature, the contrast between the dark foliage of the shrubberies, and the rich light green of the velvety sod sloping to the very water's edge, has a charming effect when viewed from the elevated position alluded to.

Proceeding round the lake, I noticed a very pretty oriental looking Turkish smoking saloon, in a retired spot, not very far from its margin; and in near proximity to this, an ornamental bridge of Chinese design, if I remember correctly. At no great distance from this, I was shown by Mr. Scott a small pond, rendered, at least to me, highly interesting, as it contained a nice collection of our rarer hardy aquatic plants, and among others the *Anacharis Æsinastrum*, a plant which, till within the last few years, was not known to exist in the old world, being confined altogether to North America, and what renders it more interesting, in this very pond it made its first appearance, without there being any possibility of tracing it satisfactorily to its transatlantic origin; indeed, the fact of its having been discovered since, in several widely distant localities, even as far north as Berwick-upon-Tweed, tends to strengthen the belief of its British origin. Returning to the house, on ascending the hill, we find a very handsome temple, dedicated as “sacred to parents and friends,” as the inscription above the portico “*sacrum parentibus et amicis*” intimates. A glance at the interior was all my time would admit of, that being but sufficient to excite a wish to examine more minutely the many beautifully sculptured busts it contained. These objects we have here mentioned are but a few out of the many which are scattered through, and contribute largely to the beauty of the grounds. In connection with the mansion is a large conservatory, or it may be perhaps more appropriately termed an orangery, as it contains the finest and healthiest collection of Orange trees I have ever had the fortune to see. The structure is about 60 feet long, 40 feet wide, and about 14 high. The roof being on the ridge and furrow system, the plants are all in the most luxuriant state of health it is possible to imagine, loaded with their large and richly coloured fruit, and filling the atmosphere with the delicious fragrance of their flowers. When standing in the centre of such a house, there is really little left for the imagination to work out, in order to fancy yourself transport to the Orange groves of Andalusia. Besides Oranges, we observed fine plants of the Shaddock, the Lemon, and the Lime, all laden with fruit. We also noticed large specimens of the Tea Tree, *Thea viridis*, and the Camphor, *Larus Camphora*. This conservatory is accessible from the dining-room, being separated by glass folding doors; and how delightful must it not be to cast the eye up such an avenue, whose sides are formed by richly laden Orange trees, the branches bending to the ground from the weight of their golden crop—and now and then to admit a few of those gentle zephyrs, which have been sporting amid such exquisite fragrance. Surrounding this structure is a neat little geometric flower garden, and though rather early in the season to be seen to much perfection, it looked remarkable gay,

and gave goodly promise of a brilliant display in the autumn. A large number of the rarer Coniferae are planted contiguous to the flower garden, and thriving exceedingly well—amongst them we observed a fine young plant of the new Chinese Cypress, *Cupressus funebris*, the largest specimen we have yet seen of it; also good plants of the Deodar, *Cryptomeria*, *Cupressus torulosa*, *Taxodium*, and indeed all the rarer Pinuses. The kitchen garden being on rather a limited scale, the most important feature we come to, is the principal range of hot houses, consisting of a large central house or Palm Stove about 60 feet by 50, and between 30 and 40 feet high; a wing from the north side is devoted to Orchideous plants, and on either side are Vineries, a Heatherly and a peach house. The most observable feature of the Palm Stove, is that the plants appear to luxuriate in a state of nature; the only thing to be regretted, is the prospect of their becoming in a few years, impatient of the narrow limits which confine them. Indeed a noble specimen of the Sage Palm, *Sagrus saccharifera*, whose leaves are as much as 30 feet long, and 8 feet wide, has already reached its utmost limits, and bids fairly, in the absence of other supports, to form a very substantial one in the centre of the house, that is, of course, provided its leaves do not think themselves above the task. We observed also a fine plant of *Caryota urens*, the Wine Palm, with leaves of a similar length, and in full flower—an excellent specimen of the Date, *Phoenix dactylifera*, the Oil Palm, *Elæis guineensis*, and *Lantana borbonica*, nearly 20 feet high. Among the tropical fruits, the Mango, *Mangifera indica*, may deservedly stand first on the list; it is a fine plant, completely loaded with fruit. On inquiry I found that upwards of 200 had “set” upon it, of which 50 were thinned out, the remaining number 150 being deemed as many as the plant was capable of bringing to perfection. Not very far from this, there stands a beautiful pyramidal specimen of the Clove, *Caryophyllus aromaticus*—it is about 23 feet high, and has the lower branches hanging over the edge of the tub. The Allspice Tree, *Pimenta vulgaris*, grows in a most luxuriant manner, and produces flowers and fruit in abundance, it is upwards of 30 feet in height; also the Nutmeg, *Myristica moschata*, and the Cinnamon, *Cinnamomum verum*, this latter is about 10 feet high. The Chocolate, *Theobroma cacao*, a fine specimen just coming into flower; others which we observed, were *Nephelium Litchi*, and *Nephelium Longan*, *Mammea Americana*, *Anona Cherimolia*, and the Star-apple, *Jambosa vulgaris*, covered with fruit, also the Jack fruit, and the Carica Papaya, the stem of the latter must be nearly a foot in diameter, and the Bambusa or Bamboo, with canes about 15 inches in circumference.

One of the most natural features in this house is the creepers; if the reader would just picture

a plant of *Allainanda cathartica*, growing beautifully wild amongst the Palms, and along the roof, apparently unrestrained by the artistic and and order loving hand of man, covered with—I do not think I exaggerate when I say upwards of 1000 blooms, and that not for a day nor a week, but for months, he would be able to form some idea of its beauty and permanent excellence; other creepers are the *Combretum purpureum* and *Quisqualis indica*, the latter trained the whole length of the house, and flowering freely; another plant not to be passed over silently, is a fantastic and truly characteristic specimen of the Indian Rubber Tree, *Ficus elastica*, training itself up to the west end of the house, where it appears quite at home, sending out hundreds of gracefully hanging roots, many of which having gained the soil, were rendering considerable assistance to the old parent stem. We had almost omitted to notice the perfection in which the *Musa* or Banana is cultivated here. The two most fruitful varieties are *Musa Cavendishii* and *M. maxima*; the last year a bunch from the latter was exhibited at the Horticultural Society's rooms weighing no less than 133 lbs., some of the individual fruit being 14 oz. in weight, and 11 in. in length; The Collection of Orchids is both extensive and select; at the period of my visit there were several fine specimens of *Calanthe veratrifolia* in bloom; one had as many as 15 spikes of their pure white and delicate flowers just coming to perfection. The *Peristeria elata* or Dove plant was also sending up numerous spikes, and fine plants of *Cattleya labiata*, and *C. mossiae*, in a condition which would warrant them no insignificant position on the richly decorated stages of metropolitan exhibitions. Various *Oncidiums* and *Dendrobiums* were also in bloom; and we observed a fine plant of the rare *Ansellia africana*, growing very luxuriantly, also large masses of *Cyrtopodium*, *Maxillaria*, &c.

The Vineries and Peach houses, by their excellent condition, gave good evidence that in the attention bestowed on the rarer tropical fruits, they were by no means forgotten. We passed through a beautiful house of Muscats, remarkable for the great regularity in size of the bunches, and the berries being far above the average standard; besides those in this range, there are two houses devoted to early forcing, which, if I mistake not, were at one period heated by polmaise—a circumstance I quite neglected to inquire into. In proceeding to the new tropical house, we passed among three ranges of span-roofed Pine pits each 60 feet by 15, and all heated by hot water in connection with one boiler. The Pines here are cultivated both on the planting out system and in pots; and under all circumstances, from the youngest to the oldest, they present a most healthy and vigorous appearance. There were numbers of very fine fruit just in admirable order for the decoration of

the desert table. A portion of one of these is fitted up as a house for the culture of Melons, of which there was a very fair crop; among other varieties nice fruit of Mr. Fleming's new hybrid. Proceeding onward we arrive at the last structure which we have to notice. This is a span-roofed house, 27 feet by 24, and 12 feet high; it was built a few years ago with a view of growing to perfection, and if possible fruiting the Bread fruit, *Artocarpus incisa*. This plant, as is generally known, requires a great amount of heat; it appears to suffer much if the thermometer is allowed to fall even as low as 60° in the depth of winter; so with this in view, the command of heat both terrestrial and atmospheric is very great, and for so far the first of the two objects aimed at has been fully attained, as on entering, the eye is met by two noble specimens of the Bread fruit about 17 feet high, and fully 30 in circumference, branching and growing most vigorously, and judging from appearances, many years will not elapse before the production of fruit may take its place as one of the highest among the many achievements which horticultural skill has accomplished within the last few years. Besides these trees, we observed a fine young plant of the Cocoa-nut, *Cocos nucifera*, about 11 feet high, also the Mangostien *garcinia mangostana*, well branched from the ground, and as much as 12 or 14 feet in height; it was when we saw it, rather bare of foliage, but was just bursting into a very luxuriant growth. In a small and very neat glass case we noticed several pitcher plants, including *Nepenthes Rafflesiana*, also a new imported plant of the true *Durio gibethinus*—a tropical fruit of great variety in this country. From one of the supports, the *Hoya imperialis* was rambling as if quite at home, producing many of its large umbels of flowers, and on the back wall the *Granadilla passiflora quadrangularis* was fruiting freely.

Such is a brief and very imperfect sketch of this most interesting place. I much regretted that my time was so limited when I called, as I fear there are many important features that may have escaped my notice.

SIXTEENTH REPORT OF THE COMMISSIONERS OF NATIONAL EDUCATION.

The sixteenth report of the Commissioners of National Education in Ireland (for the year 1849,) presented to both houses of parliament, has been forwarded to this office, and has been lying on our table for some time; but, owing to press of business, we have not been able to give it that notice which it deserves. We now present our readers with those sections in the report which bear more directly on the model agricultural schools:—

"We have reason to be satisfied with the management of our model farm, at Glasnevin, during the past year. In our report for 1848, we referred to the enlargement of the farm,

which now comprises 128 statute acres. The additional land we have recently taken rendered it necessary that the existing farm-buildings should be considerably enlarged, and that provision should be made for the accommodation of a much greater number of agricultural pupils. Upon an examination of the premises, with a view to extensive changes and improvements, it was found that, without incurring great expense, they could not be adapted to the growing wants of the establishment. We decided, therefore, after full consideration, to erect a new range of farm-buildings, upon the most modern construction, and of sufficient extent to accommodate about 100 agricultural pupils. Suitable plans and specifications have been prepared, and we have entered into a contract with an experienced builder for the erection of the buildings, which will be commenced during the summer. The estimated cost, £5,615. The existing buildings will be made available for various purposes connected with the farm.

"We are happy to state that there is an increasing desire, on the part of patrons of schools and many of the landed proprietors, to obtain admission for pupils into the Glasnevin model farm. In the year 1849, 34 pupils and agricultural teachers were admitted, and 43 remain up to the present time. A list of the total number trained since the 1st of November, 1847, to the 31st of March, 1850, and of those now under training, is given in the appendix. The pupils of the Glasnevin establishment receive literary as well as agricultural instruction. Their evenings are devoted to mental improvement, under the care of a first-class teacher, and they have access, at their leisure hours, to a select library of agricultural works. All the male teachers received into our training establishment are required to attend the daily lectures of the agriculturist, and to visit the model farm one day in each week for the purpose of seeing its practical operations.

"Our agricultural class-book, which we published in 1847, for the use of the advanced pupils attending the national schools, has had a considerable sale in Great Britain and Ireland, and has been found exceedingly valuable, especially in schools in which agricultural is combined with literary instruction. We continue to distribute amongst our teachers cheap and useful works on agricultural subjects. It is our intention to provide each of our district model schools that have farms attached to them with a collection of such publications. A "farm account-book" has been compiled by our direction, which has been introduced into our agricultural schools, and has been approved of by many eminent practical agriculturists.

"The following model agricultural schools, thirteen in number, are in full operation, and each of them is connected with an elementary national school:—Larne, county of Antrim;

Markethill, Armagh; Holywood, Down; Carrick, Fermanagh; Loughash, Tyrone; Sallybank and Belvoir, Clare; Rahan, King's County; Loughrea and Ballanikill, Galway; Kyle Park, Tipperary; Bailieborough, Cavan; and Dunmanway, Cork. The three last are under our exclusive management, and the land is vested in us. Two of them are district model schools.

Besides these model agricultural schools we have made building grants towards the erection of ten others.

"In some of these cases leases of the land have been executed, and the buildings are either in progress or about to be commenced. With regard to the others, steps have been taken towards the preparation of the leases; and in some, the plans of the farm premises have not yet been finally adopted. The following is a list of these schools:—Dunlewy, Donegal; Bath, Monaghan; Mount Trenchard and Tervoe, Limerick; Ardinnan and Derrycastle, Tipperary; Woodstock, Kilkenny; Leitrim, Leitrim; Glandore and Farraghy, Cork.

"There are several other cases to which we had promised assistance. Our correspondence with the local parties regarding them is not closed; and it is not yet certain whether they will be in a position to avail themselves of our aid upon the conditions we now require. Several grants were cancelled, during the year, owing to the inability of the applicants to raise the requisite amount of local contributions, and from other causes.

"The following table shows the provinces in which the model agricultural schools are situated:—

Provinces.	Model agricultural schools.		
	In operation.	To be erected, or in partial operation.	Total.
Ulster.....	6	2	8
Munster.....	4	6	10
Leinster.....	1	1	2
Connaught.....	2	1	3
Total.....	11	10	23

"The number of our ordinary agricultural schools, to which only two or three acres of land are annexed, has increased during the past year. At the present date, there are 34 in operation, and several new applications have yet to be disposed of. The only aid they receive from us is an addition of £5 per annum to the master's salary. He pays the manager a moderate rent for the farm, and receives the amount of the produce sold. These schools are, in general, working successfully, and have fur-

nished satisfactory proof, that literary and agricultural instruction can be practically united without counteracting or encroaching upon each other. Our inspector of agricultural schools, Dr. Kirkpatrick, has been active in the discharge of his important duties. All the existing agricultural schools have been visited by him once during the year, the majority of them twice, and several more frequently. He has also reported upon all new applications received during the year. In his general report, he observes:—"I feel gratified in expressing my strong conviction, that it is perfectly practicable, and eminently useful, to combine with the ordinary branches of a sound English education, as taught in our national schools, such an elementary course of agricultural instruction as shall prepare youths for the higher branches of agricultural science, should the opportunity of acquiring such knowledge be presented to them; and, what is still of greater moment, shall teach them to avoid those grossly defective methods of farming hitherto practised, and still in too general use throughout the greater part of Ireland."

"We give, in the subjoined table, the number of ordinary agricultural schools in each province:—

Ordinary agricultural schools.

Provinces.	No.
Ulster.....	12
Munster.....	5
Leinster.....	11
Connaught.....	6
Total.....	34

"We have inserted in the appendix the report of our agricultural inspector on the model and ordinary agricultural schools at present in operation. It will be seen that the system is gradually taking root, and likely to produce good fruit. Special reports have been furnished by the teachers on the agricultural schools of Loughash, Market-hill, Larne, Belvoir, Rahan, and Dunmanway. These reports, which will be found in the appendix, contain a statement of the farm accounts, of the mode of cultivation adopted, and of general results, so far as they could be ascertained.

"We have received, during the past year, a considerable number of new applications, from all parts of Ireland, for grants towards the erection of model agricultural schools. We have found it necessary to postpone our decision upon twenty of the applications, and to reconsider the conditions upon which we formerly promised grants to schools of this description.

Before stating our reasons for adopting this course, we consider it desirable to republish some of the statements contained in our former reports on the subject of agricultural instruction in our national schools.

"Our grant towards the building of a model agricultural school, upon the plan we originally proposed, did not exceed £200. The remaining proportion required for building and furnishing was required to be raised by local contribution. The expense of providing implements of husbandry, stock, and seeds, was defrayed by the local parties by whom the model schools were to be managed. We paid neither rent nor taxes for the land. The only portion vested in us was the site upon which the farm-buildings have been erected.

"From information subsequently obtained, through our district inspectors and other sources, we deemed it expedient to enlarge our scheme, and came to the following conclusions, which we announced in our report for 1847:—

"That we ought to increase our grant towards the building of model agricultural schools, with a teacher's residence, and the necessary farm-buildings attached to each, from £200 to £300, upon a local expenditure of, at least, £150. We propose that from six to eight acres of land shall be annexed to each of these schools, and the premises vested in us in our corporate capacity, for a term of at least three lives and thirty-one years. To the teachers of the model agricultural schools we propose to give a salary of, at least, £30 a year, besides a suitable residence, and accommodation for a limited number of agricultural pupils. We propose, also, that a portion of the grant shall be applied to assist in the purchase of stock, and the necessary farm implements. It is intended that the advanced boys attending model agricultural schools shall receive instruction, during school hours, in the theory of agriculture, by means of the series of books to be provided, and be required to assist, before or after school-hours, in the labour of the farm."

"In our report for the same year it was stated that, 'although we may become instrumental in promoting the cause of agricultural education in Ireland, we feel bound to state, that we can accomplish little, unless our efforts be cordially sustained by the co-operation of the landed proprietors of the country. The agricultural schools must, in almost all cases, be erected by them, and conducted under their directions. It will be necessary for them to expend much money, and bestow constant care upon them. The salaries, training, and inspection, furnished by the state, are indispensable; but they will be unavailing if local expenditure and exertions do not supply the groundwork upon which the assistance of government is to be brought into operation."

"Referring again to the subject of model

agricultural schools, in our last report, we observed, that the result of our limited experience has convinced us, that the establishment of model agricultural schools will be attended with far greater expense than was at first anticipated, either by ourselves or by local applicants. We are at present engaged in making inquiries upon this important subject, and we have submitted plans for building this description of schools to persons of practical knowledge and experience.

"We have thought it necessary to transcribe these passages from former reports, respecting model agricultural schools, in order that your excellency may be enabled to form a correct opinion of the difficulties with which we have had to contend in carrying our plan into effect, and of the reasons which have induced us, after mature deliberation, to make the important changes which it is now our duty to explain. Having made inquiry as to the description of farm buildings, suitable for farms varying in extent from eight to thirty acres, and uniting the essential requisites of economy with sufficient accommodation, we obtained various plans and specifications, which we submitted to the inspection of several persons qualified to judge of such matters. We have ascertained that the erection of farm buildings, with a literary school for 100 children, and a residence for the teacher, agriculturist, and pupil teachers, will cost from £800 to £1,000, according to the size of the farm. In this sum we do not include the cost of furniture, farm implements, and stock.

"Assuming the expense to be on an average at least £900, the largest sum that could be obtained from the applicant locality would be the half of that sum, £450. As the farm, as well as the building, will henceforth be vested in us, we shall become thereby responsible in each case for the annual repairs, for the furniture, the rent, and taxes, the expense of maintaining the resident pupils, and for the salaries of the teachers during the continuance of the lease. The question which we had to decide upon was, whether, under these circumstances, we ought to undertake the direct management of these schools, or leave it, including as it does the appointment of teachers, the selection of apprentice pupils, and the general arrangement of all the details of school management, to the applicants themselves, as has hitherto been the case. We have resolved, after the fullest consideration, to undertake the management ourselves. Hitherto the original outlay on agricultural schools was comparatively small, and the land was not vested in our corporation. If the school did not succeed, the loss to the public was inconsiderable. We accordingly felt that we were not incurring too great a risk, and that we saved ourselves from much expense and trouble, in leaving the management of the school to the public spirit, and private interest, of the persons locally connected with it. But

now the sum that must be contributed by the board is large, and all the future cost of maintaining the buildings and carrying on the whole establishment, must devolve upon us. In consequence too, of the farm being vested in our board, the local parties, if the management were confided to them, might at any time, after suffering all things to fall into disorder, cast upon us the whole expense and responsibility of repairing the mischief. Furthermore, the school having become, from the expense incurred, and the extent of accommodation supplied, of so important a character, a mere general veto possessed by us on the appointment of the teacher would not be sufficient. It becomes necessary not only to guard against the appointment of an incompetent master, but to appoint the best that can be selected. So with regard to the choice of the apprentice pupils to be boarded in the school, if the nomination were left to the local manager, he might indeed choose fit persons, but would, perhaps, select them from his own estate exclusively, and thus entirely deprive the school district at large from partaking fairly of the benefit intended for it. Should the proprietors wish such schools to be established on their estates, and to have the direction of them, they must undertake the chief expense in erecting and carrying them on. The state will have done all that can be fairly expected from it, by placing, at considerable cost and risk, in various parts of the country, the best examples it could furnish to the gentry, of the mode in which agricultural and literary instruction may be effectually combined in a country circumstanced like Ireland.

"For the purpose of carrying into effect the above views, we have adopted the following conditions upon which grants are now made to schools of this description:—

"1. The commissioners will take land, from eight to thirty acres, for the purposes of model farms, at a moderate rent, on a lease of at least three lives, or thirty-one years.

"2 The lease must contain a clause of surrender every fourth year.

"The commissioners will not commence rent, nor enter upon the land, except the portion on which the buildings are to be erected, until the 25th of March or 29th September next ensuing after the completion of the works.

"4. The commissioners will grant towards the building a sum not exceeding £400, unless in cases where they may deem it desirable to provide two school-rooms. The remaining portion of the expenditure must be locally subscribed, and the amount of local contribution must be lodged in the Bank of Ireland to the credit of the commissioners before the works are commenced.

"5. The buildings will be put up to tender; they are to be erected under the supervision of the architect to our board, or of the clerks of

works; and the grants will be paid by instalments on their reports.

"6. The commissioners will furnish the dormitories and school-house.

"7. The commissioners will supply (in the first instance) the necessary stock, farm implements, seed, &c., &c.

"8. The commissioners will contribute £7 10s. towards the maintenance of each of two resident agricultural pupils; provided the pupils or their friends contribute a like sum.

"9. Where one teacher only is required, the commissioners will grant £10 a year for his services as agriculturist, in addition to his class-salary as a literary teacher.

"10. Where the farm consists of fifteen acres or upwards, the commissioners will grant salary to an agriculturist not exceeding £30 a year, and also to a literary teacher according to his class.

"11. The commissioners will require the teacher or agriculturist to pay a moderate rent for the land, and all taxes, rates, &c., allowing him the profits arising from the farm. They will also require him to enter into arrangements for keeping up the supply of stock, implements, &c., &c., and for providing for permanent repairs.

"12. The agriculturist will be required to conduct the operations of the farm according to the directions of the agricultural inspector, and must furnish accounts in the form prescribed by the commissioners. He must also submit annually to the board, to be laid before parliament, a statement of the working and progress of the farm during the past year.

"The commissioners, in consideration of the large amount of expenditure incurred by them, and the land being vested in them, deem it indispensable that they shall have the exclusive management of the model agricultural schools; the right of appointing and removing the teachers and resident agricultural pupils; the latter to be selected from among the pupils of the national schools in the district in which the model agricultural school is situated.

"We have heard, with much surprise, that an impression exists in many quarters that our agricultural schools will have an injurious effect, in confirming the practice of small farming amongst the people of Ireland. Instead of multiplying agricultural schools, with small farms attached to them, we ought, it has been said, to have expended the money placed in our hands by parliament for agricultural instruction, in the establishment of a few great agricultural schools, with extensive farms connected with them. To this we answer, that our intention in combining agricultural and literary instruction in the national schools, is to teach the masters and pupils agriculture generally, without reference to the extent of the farms in the cultivation of which they hereafter be employed. The

course of agricultural instruction which we are desirous of providing for the labouring classes in Ireland is equally needed by all farmers, and alike applicable to *large* and small farmers. Furthermore, a large portion of our expenditure under the agricultural department is incurred on our model farm at Glasnevin, which, instead of being a small farm, is, under the circumstances of Ireland, a large one, consisting, as we have said, of 128 statute acres. Upon this farm all the national teachers who, to the number of 200, are yearly trained by us, have an opportunity of seeing reduced to practice those principles of improved agriculture which the agriculturist, in his daily lectures, explains to them. In addition to this, the pupils and teachers specially trained in agriculture, at Glasnevin, are there fully instructed in the theory of agriculture, are engaged in daily labour on the land, and see exhibited there as good a specimen as can be furnished by us of the manner in which a large farm ought to be conducted. The number of these pupils and teachers is at present nearly 50, and will soon be 100. The agricultural pupils, who, as well as the teachers, are boarded and lodged by the commissioners, are selected impartially from the most deserving of all the pupils in the several agricultural schools in Ireland. These little endowments form, in fact, so many agricultural scholarships, and are calculated to furnish one of the most useful bounties upon agricultural education throughout the national schools. We might, doubtless, have proposed to expend the fund placed at our disposal, upon the establishment, throughout the several provinces of Ireland, of a few large model farms, similar to that at Glasnevin. Instead of doing so, we have, on the fullest consideration, greatly preferred the establishment of a large number of agricultural schools in all quarters, with farms annexed, which as they must be managed by the teachers of the respective national schools, must necessarily be small, and will probably vary from 3 to 30 acres. The question is, which of these two courses is the one which if adopted by the state, will most encourage the advancement of agricultural prosperity in Ireland. We feel confident that the course which we have adopted is a judicious one. It may be most desirable that large model farms should be established by the state, or by societies, in various parts of Ireland; but we are of opinion that the chief good that can be effected by us, in the way of agricultural improvement, is by blending, in as many of our 4,500 schools as possible, instruction in agriculture and daily occupation in agriculture, with the literary instruction already given in those schools. Should the plan proposed by us be largely adopted throughout Ireland, improved agricultural knowledge and skill will be diffused throughout every part of the country, and throughout the whole mass of the rural population. The boy

taught in one of those schools will be enabled, in after life, to contribute his full share to the agricultural prosperity of the country, whether his vocation be that of a farm labourer, a small farmer, or a large farmer. He will, from his childhood, be taught to labour on the land, and to labour skilfully; to see displayed the rotation of crops, the application of manures, the management of cattle, the art of trenching and draining land. Every habit thus acquired by him, every kind of agricultural knowledge thus conveyed to him upon the limited farm of the teacher, will be equally serviceable to him, should he in after life become a large farmer, or if he never rise above the condition of a cottier.

On reference to the tables it will be perceived, that the richer and more enlightened provinces of Leinster and Ulster have, of ordinary agricultural schools, in the former, twice the number that are in Connaught, and in Leinster more than twice the number of those in Munster. Now, Connaught and Munster being the provinces most in need of instruction and encouragement—being also the districts most steeped in misery and destitution, should, in our humble opinion, be the districts that should more particularly engage the attention of the commissioners. We trust that this proportion will not hold much longer, and that the united exertions, energies, and the large means placed by the country at the disposal of the commissioners, shall be exercised for the next year in reversing the proportion, withholding from those less in need, and extending to those in absolute destitution, till the number of ordinary agricultural schools (in which we place the most reliance) shall at least double the numbers in the favoured provinces of Leinster and Ulster. We are also of opinion, that as money is of greater value in those poor provinces of Munster and Connaught, that the scale of local subscriptions should be reduced much below that which may be fairly exacted where the value of money is much less; in other words, the scale of local subscriptions should be in proportion to the money value of land and agricultural produce, as we think it preposterous to exact the same sums in districts where land is to be had for much less than 10s. the acre, as may be in districts where land brings 30s. and upwards. Unless some such modification as the above takes place, we much fear that Munster and Connaught, so capable of improvement, and the necessity of developing their resources so universally acknowledged, shall still remain in the back ground.

We trust that Dr. Kirkpatrick, whose exertions in the cause of agricultural improvement are so well known to the public, and whose position as chief inspector of National Schools in Ireland, must make him conversant with the facts we have stated, will lose no opportunity in recommending to the board those suggestions which we now deem in our duty to make.

ON THE ADVANTAGE OF GREEN CROPS TO A FARM.

In travelling to various parts of England, I have remarked how varied are the systems of culture, and the succession of crops. In one part I have seen more than half the land under the green sward, as the red marl district of Leicestershire. In another part I find no green sward but what comes under a rotation of cropping, or Down Land, such as the Cotteswold and Chalk hills.

In Cornwall I observed, some years ago, that the old cultivators continued to crop the ground with *cereals*, until it could produce no longer, and then it was put down in grass to rest; that is, by sowing amongst the crop of oats, grass seed, perhaps swept out of hay-lofts, with all manner of weed-seed. In this state it lay for three or four years, until it became so mossy and weedy that it would no longer produce grass; then it was broken up for wheat, by a process which, to us of the eastern part of England, was unique. A granite stone roller, about five feet long and 12 inches diameter, had steel edges or cutters fixed at every six inches of its length, projecting from the surface of the stone about three inches; this instrument was run over the grass and one way across, and ploughed the other way; thus was the surface of grass cut into small squares, and thrown up roughly to rot; after which it was (during the early autumn) buried for wheat or other corn. The farmers of Cornwall are fast passing into a superior system, and no longer is there need for clauses in their leases restraining them from taking more than three crops of corn in succession.—(See *Journal of Royal Agricultural Society*, vol. 6, part 2, page 431.)

The subject towards which every system of culture should have tendency is, that of making the earth produce the greatest amount of return from the smallest possible expense; therefore the endeavour should be to extract from the soil a food for some variety of animal or other, and endeavour at the same time to increase permanent fertility. This only is to be done by leaving something behind, beyond what we take out of the soil; therefore, either more must be put on the surface, in the shape of manures, for the succeeding crop than it requires, or a portion of the crop must be left on the ground to constitute a pabulum for future crops, so to form a vegetable humus in the soil. This humus is the blackened material which is found in the pan under the usual tillage, and is the result of culture and manurings. The same humus is shewn by the blackened fertile soil of old garden grounds.

The object, then, of a proper succession of crops is, that a something should be left behind from each crop, which shall be of service to a succeeding one, and not to call on the soil to yield in succession the same valuable

materials that are detracted by a crop of wheat which crop is, in all places, considered as the great desideratum. Green crops, therefore, when consumed on the land, are highly fertilizing operations; and at the same time, if the green crop is such an article that is suitable, so the animal reared or fattened on it, is sure to be highly remunerative as a marketable return. Tares, clover, turnips, &c., fed on the ground, will be charging the soil with a pabulum for future crops; and, after either of these expenditures, wheat may follow with propriety; and if these crops are only half consumed by the animals, (there being plenty of food on the farm) the advantage of ploughing in the half-consumed vegetable will be felt in the succeeding crop, for then, what is left will not have had detracted from it that portion which would have gone to constitute blood, flesh, bone, &c., in the animal that might have consumed the same.

Assertions are sometimes made by farmers, that to save a second crop of broad clover for seed will be more enriching to the land than if cut before it is ripe; that forming seed does not detract from the land; but the contrary is the fact. Producing seed is, in every case, the most exhausting of particular matters to the soil; but when this practice is set in comparison with other parts of the same field that had been cut green for foddering stock at home, it is likely that the appearance of the succeeding crop may be in favour of where the seed has been saved; for in such instances, the crop remaining on the land for a longer period, the plants lose most of their leaves, which fall to the ground as a nourisher; whereas, where the clover has been cut green, all has been cleaned away from the land. Leaves of most plants generally contain a very considerable portion of the inorganic fertilizers.

One of the greatest benefits to be derived from a proper succession of green crops, is the aid which the tap-rooted plants afford, by penetrating beneath the hard pan into the subsoil, there extracting and bringing up from a depth below fertilizing matters that may be deficient at the surface. These, as food to the plants, are most likely to be the aqueous particles that hold solvent in them various portions of alkalies and acids, phosphates and carbonates; and these matters are deposited on the surface at every fall of the leaf, combined with the solidified parts of air and water. Turnips, mangel wurzel, and other broad leaved plants that successively deposit their lower leaves, are enriching the surface with much organic and inorganic matters, which constitute their bulk; and this they do even if the bulbs and tubers are carried from off the land at an early period, when they have scarcely done increasing in bulk.

On referring to the analysis handed to us by Sprengel, I find that all broad-leaved plants take up from the soil much more of the fixed

ingredients than do the farinaceous crops that have narrow leaves. Cabbage, beet-root, Swede turnips, &c., take up double the quantity that would be extracted by a crop of wheat; hence the advantages of leaving the produce from these crops on the ground, and in particular their foliage.

I am aware of several arid soils in England and on the continent of Europe, which when first taken possession of by man, were not fit for agricultural purposes; but on their being planted with trees of various kinds that yearly shed their leaves, the ground has become lightly enriched for many crops that require the alkalies and carbonaceous matters to build up their structure: the alkalies having been obtained from below by aid of the roots, and carbon supplied from the carbonic acid which is solvent in the air.

The green crops on a farm must be made in proportion to the corn crops that are to be consumed. High farming may be denominated such a system that the principal part of the produce is consumed on the land, the wheat being the only crop of grain sent to market. The hay, straw, and green crops are best sent to market on four legs, in the shape of reared or fattened animals: these, according to the late prices of animal produce, have answered the best purpose for those farmers who could adopt it, and in particular those who could breed and rear their own stock; and for the land, such practices will at all times make that in the best condition.

Experience has taught the farmer, whenever he can spare a green crop, (it not being wanted for his animals) if the crop is rolled down before it obtains its full growth, and ploughed into the soil, that it is a great enricher of the same for succeeding produce. By this act, not only are all the inorganic matters deposited, but also a mass of organic in the shape of the solidified ingredients of air and water. Vetches, buckwheat, rape, &c., may, with great success, be often ploughed into the soil for a succeeding and more valuable crop. Mere casualties have often proved to farmers certain facts; for instance, turnips have been fed off by sheep on one part of a field, and in the other part of the same field the like quantity of turnips have been rotted by winter frosts and then ploughed in for a second crop of Lent corn: it has always been the most superior in that part where the rotting had taken place, for this obvious reason, viz. that no part of the crop has been carried away in the shape of bone, flesh, and blood, but all, organic and inorganic, had been buried for the service of the succeeding crop.

On referring to ancient works of agriculture, it could be proved that the Roman nation were well aware that a judicious succession of crops was necessary, and that several corn crops ought not to succeed each other. Pliny informs us, that the Romans were conscious of the utility of

alternating leguminous with farinaceous crops, the farmer acting as restoratives to the land, while the latter were exhausting ones. By burying vegetable matters in the soil, they give out their gases progressively as decomposition proceeds; thus the process acts as an aeration of the soil, imparting warmth, and charging it with the gases obtainable from the air in the process of fallowing. A rotation of cropping may, therefore be adopted, by means of which the practice of fallowing may be totally discarded seeing that the foulest land may be cleaned of its rubbish by the horse and hand-hoe husbandry.

In confirmation of the view I have taken of the benefits to be derived from green crops, and of having one of these succeed between each of the cereals, I would quote the practice of Mr. Morton, on Lord Ducie's model farm, in Gloucestershire, where he is able to grow wheat with success every alternate year, half of all the arable land being occupied with the grain—this grain being chosen for the experiment, because it is the most remunerating one; and yet the land is not by any means exhausted, as is shown by the increasing yearly produce, the average of the farm being often about five qrs. per acre.

The practice of Mr. Morton is to vary the green crops, so that clover, for instance, should not be repeated on the same spot oftener than every tenth year; and this he is enabled to do by having five varied green crops, taking their places in succession one after the other regularly. I am not quite sure of the order of this succession, but it is sometimes after the following with respect to the green crops.

The manuring is of course ordered in such a scientific manner, that it shall supply the exhausting matters that are abstracted from the land. The soil of the farm is of a varied rocky character, a part being on the mountain limestone, other portions on the magnesian limestone, and another on the grit of the old red sand, or Silurian district.

THE ORDER OF CROPPING IS:—

- 1st and 2nd.....wheat succeeded by clover.
- 3rd and 4th.....wheat succeeded by carrots or parsnips.
- 5th and 6th.....wheat succeeded by vetches or peas.
- 7th and 8th.....wheat succeeded by turnips or Swedes.
- 9th and 10th.....wheat succeeded by beans.
- 11th and 12th.....wheat succeeded by clover.

By the above order of succession, it will be seen that a tap-rooted crop succeeds a green crop, that has its nourishment more particularly from the surface soil. It will also be evident that for the above order, it is necessary there should be ten enclosures or plots of about equal sizes. The success of this culture may, in part, be ascribed to the first spirited outlay on the land by his lordship in remodelling the farm, cutting down all the timber, under-draining, subsoil ploughing, new division fences made parallel with one another, and formed into

squares of about ten acres, each according to the fall of the ground—the ditches being kept open, and no wood allowed in the hedges to grow, to constitute a shade to the ground.

ON THE FOOD OF PLANTS.

If the substances of which we speak are only to be regarded as excretions, or as an attempt made by the organs to relieve themselves of useless matter, it becomes necessary to explain how it happens that potash and soda, added to a soil deficient in alkalis, so powerfully assist vegetation. We can only understand the action of these substances, by supposing them capable of supplying an element necessary to the growth of vegetation, and perhaps they also in some way or other assist the chemical changes which are going on in the interior of the plant.

For certain plants it is necessary to admit the value of chalk or lime; and the importance of gypsum to certain of our cultivated plants, is also sufficiently well known to prevent it from being considered a substance to which they are indifferent. If it be also considered that silica, alumina, phosphoric acid, oxalic acid, &c., are not deposited indifferently in all portions of the plant, but in certain special determinate organs; that there is, therefore, on the part of these organs, a certain power of choice—a vital action, which enables them to separate those substances from the sap which they require, to the exclusion of others—it is difficult to assign any other reason for this well known arrangement, except that nature has prepared a special place for each of these substances, and has assigned them certain determined functions in the formation of the vegetable tissues.

These reflections conduct us to the conclusion that a great number of the earthy and alkaline substances, carried by the current of the sap into the circulation, are useful to vegetation, by giving them their full vigour, their proper size, and their diversified properties. We do not yet pretend to be able to assign to each one of these various substances its particular function in accomplishing these important ends. It may, perchance, be shown at some future time, that certain compounds are absorbed and assimilated by plants in the state in which they exist already in the soil, or in the manure. The science of vegetable chemistry is yet far short of perfection, and holds out the most brilliant results to those possessed of industry and skill necessary to investigate this difficult subject.

After having thus settled the first question proposed, another one arises—Do all plants make a similar consumption of the soluble materials present in the soil, or have they the power of selecting those most suitable to their wants? In a word, do the different species of plants require, each a different nutriment?

Plants even when grown in the same soil do not draw up a sap exactly identical. Saussure has proved in the most positive manner that the roots have the power of selection, though his experiments on the unequal absorption of different salts are not quite satisfactory; for instance, sulphate of copper, though soon causing the death of the plant, is absorbed in as large quantities as any of these compounds which are beneficial to vegetation. Saussure explains this anomaly by showing that in the case of the sulphate of copper, the roots were decomposed, and consequently, except at the commencement of the experiment, only acted mechanically. It was well ascertained that the substances present in any solution were absorbed in very different proportions where their substances were not, like the sulphate of copper, positively injurious—for instance, *Bilens* (bur-inarygold?), *Polygonum* (buckwheat?), absorbed the salts in the following proportions:—

	<i>Bilens.</i>	<i>Polygonum.</i>
Chloride potassium.....	15	14.7
Chloride sodium.....	15	13.0
Nitrate of lime.....	8	4.0
Sulphate of soda.....	10	14.4
Muriate of ammonia.....	17	12.0
Acetate of lime.....	48	8.0
Sulphate of copper.....	18	47.0
Gum.....	32	9.0
Sugar.....	8	29.0
Humus (extrait de terreau).....	6	5.0

These experiments were repeated with the greatest care, and it was proved—1st, That plants absorbed all mineral substances when dissolved in water: 2nd, That they were absorbed in very different proportions, according to the plant experimented on; this absorption was also quite irrespective of the fluidity of the solution: and 3rd, That organic matter, when dissolved in water, is not in that shape absorbed by the roots, but decomposed by their influence, and then partially absorbed.

1. Without entering into the minute details of the experiments, the absorption of the following substances was proved—prussiate of potash, chloride of sodium, sulphate of copper, acetate of lead, chloride of barium, ioduret of potassium, and many others. The absorption of nitrate of silver, corrosive sublimate, and gallic acid, did not take place until after the death of that portion of the plant plunged into their solution.

2. When the plants were placed in a solution containing two salts in equal proportion, it was satisfactorily ascertained that they were absorbed in different proportions. Even when the salts were present in different proportions, this elective absorption was not deranged. In a solution containing three times as much common salt as nitre, a plant of *Chenopodium viride* (Goosefoot) absorbed much more nitre than common salt; whilst the contrary took place with *Solanum lycopersicum* (Nightshade). Other plants selected also common salt; and the *Tamarix* choose only sulphate of magnesia.

3. It was also ascertained that, when a plant

was placed in a solution of fermenting manure, the disagreeable smell, which has been previously emitted, gradually disappeared.

If these experiments have not quite settled the question, they have at least strengthened the opinion that plants appropriate to themselves soluble substances in very different proportions. Chemical analysis of different plants grown on the same soil, also completely establishes this proposition. With regard to the oxygen, carbon, hydrogen, and nitrogen, chemical analysis has also proved that they are present in plants in proportions varying with the species, but agreeing very closely in the same plant. Analysis has also most clearly established the great diversity of the proportions in which different plants assimilate the alkaline and earths. For example, some plants will be found to contain common salt in large quantities, whilst wheat grown on the same soil will contain none. Other plants again, as the wall pellitory, the nettle, and borage, will be found to contain nitrates in large quantities, though they may be grown alongside of plants containing none at all. It seems, therefore impossible to avoid the conclusion that plants possess the property of choosing, or at least of retaining, certain substances in preference to others, and, consequently, that different plants require different food.

But this opinion does not rest on the authority of chemical analysis alone; it is confirmed by the experience of agriculturists. For instance, it is known that certain manures seem especially to favour the growth of certain plants—as gypsum for clover—that certain plants only thrive on soils where they can obtain an abundant supply of special ingredient, as the fern and the chestnut, on soils rich in potash, of such as are derived from slate rocks, and those of volcanic origin; that a mixed husbandry is the most productive; that a plantation containing a variety of trees produces more wood than if one species alone had been planted. These multiplied facts prove that it is not a certain quantity of a nutritive principle, but a choice amongst several that is necessary to vegetation.

Researches respecting the Food most suitable to different Plants.

The difficulties which are encountered in attempting to settle the general question becomes still more serious as the attempt is made to descend from general to particular cases.

It is rarely that an opportunity occurs which enables us to decide upon the effect of such or such a manure upon plants. To do this with certainty the substances tried must be in a state of chemical purity; and as plants are composed of a great number of different substances, it would be necessary to try each one of these separately, and to observe the effect of their application, and of the want of them—an admirable subject for the study of those who are

ambitious to establish on sure grounds the principles of scientific agriculture. The long and difficult experiments necessary for this purpose have as yet hardly been commenced, and our knowledge of this important subject is as yet merely empirical. But the information we already possess must not be despised because it has not as yet arrived at the perfect solution of the question, especially as the benefit of certain mixed manures to certain plants is well known. In addition to the examples quoted in a former part of this paper, the benefits of lime to cereals, and of the sulphates to leguminous and cruciferous plants, are well known. But the very limited number of instances we can quote, is a significant proof of the state of our knowledge. The most of manures used contain a great number of the elements of vegetation, and it is difficult to distinguish what each plant carries off, and what is left for future crops.

In the mean time, until the experimental application of different manures shall have pointed out what is most suitable to the plant we wish to cultivate, we have no other guide than chemical analysis, or examination of the quantity of nitrogen, carbon, and mineral matter present in the ashes of the plant. Such an analysis shows us the substances which a plant has absorbed. But it is only after having submitted the growing vegetable to an experimental test, that the effect of these various nutritive matters, and the theory of vegetable food, can be established on a settled basis. When we shall have arrived at results from the combination of these two methods, first ascertaining by *analysis* the materials, and thus satisfactorily ascertaining their individual effect, the science will then be perfect.—*Farmers Magazine.*

ON THE FOOD OF PLANTS.

If we imagine a soil properly pulverized, and yet retaining such a degree of firmness and consistency as to give a secure hold to the roots, a plant situated in it will find a matrix at fluence, and also to supply the moisture necessary for the wants of the plant. But if the mineral ingredients of such a soil are insoluble and fixed (as it is expressed in chemical phraseology), a plant will certainly live in such a situation by deriving much of the food it requires from the atmosphere. But vegetation, in such a situation, and under such circumstances, will not suffice for the farmer. It is only by means of certain soluble ingredients in the soil that this normal state is attained; and if the soil does not contain these soluble substances, or does not contain them in sufficient quantities, it then becomes our business to supply them. These supplementary substances (if the expression may be allowed), this sustenance for the plants, to which the name of "manures," or "stimulants," have been given, according to the point of view under which they are contemplated, is therefore an

important subject for study. After having given the plant a suitable dwelling-place, we must also supply it with suitable food; in this respect plants resemble animals. But, in order to understand what we are about, it may be advisable briefly to recapitulate the principles of vegetable physiology on which this doctrine is based.

If we call to mind the mechanism of vegetation, we find that water, containing various substances in solution, penetrates by endosmose into the roots, rises from thence by capillary attraction under the bark, where it is called *sap*. When it reaches the leaves a portion is removed by evaporation, and the solution, of course, becomes more condensed. Under the action of air and light, the free carbonic acid it contains is decomposed—carbon is fixed in the plant, and oxygen given off into the air. During the night, on the contrary, the oxygen of the air is absorbed by the leaves, combined with the carbonaceous elements of the sap, to be again decomposed at the return of light. The solid matters present in the sap are deposited, according to their special natures, round the cellular vessels, or on the surface of the leaves, or at certain determinate parts of the structure; the superfluous or injurious matter being carried off by the descending sap, and eliminated from the roots as excrement.

It is unnecessary to follow the sap through the various changes its elements undergo—the successive changes by which sugar, mucilage, gluten, albumen, and the various vegetable acids are formed; this part of the subject belongs to vegetable physiology.

All soluble matters within their reach being absorbed by plants (a fact well ascertained, even in the case of virulent poisons), which of these substances are so essential to vegetation that plants in general cannot be deprived of them without suffering? And, in the second place, do certain kinds require certain substances to be present in the soil, which are not absolutely necessary to others? In a word, is there in vegetables a universal food, so to speak, or does each plant require a special one? These are the questions which we have to examine.

1st. *The food necessary for all vegetables.*

The attempt has often been made to ascertain, by experiment, the substances essential to vegetation, or those by means of which the vegetable can live and grow, though deprived of all others. It has, at least, been ascertained that a plant cannot live without oxygen and carbonic acid. In an atmosphere deprived of moisture a plant will not live; water is, therefore, also indispensable, not only on account of its solvent powers, but also because its elements enter into the formation of many of the products of vegetation. As for carbonic acid, that which is absorbed by the leaves, though sufficient to

support life, does not appear to be enough to secure the full development of plants, as the following experiment (which also goes to prove the importance of vegetable matter in the soil) will satisfactorily show.

Two boxes were taken, the one containing soil calcined, so as to destroy all organic matter; the second contained soil in its natural state. In both a few grains of peas were sown, and it was observed that the plants in the former were much less vigorous than those in the natural soil. Upon examination, the first contained 46 of its weight, and the second 57, or rather more than half its weight of carbon. This difference was, undoubtedly, owing to the carbon present in the second box.

In all the experiments which have been made, none have, as yet, been undertaken under such circumstances as to exclude nitrogen in its simple form, so that we cannot speak positively as to its importance. But as it is universally present in the form of ammonia, and as it enters largely into all the more important vegetable products, we may safely affirm that nitrogen is requisite for plants.

Thus oxygen, water, carbonic acid and nitrogen, are the primary and indispensable elements of vegetation. Their action is undoubtedly assisted by the important agents, heat and light, and in all probability by electricity.

Chemical analysis demonstrates the justice of this conclusion. Amongst a great number of substances, varying with the species, and climate, and the soil, these important ingredients are always present. They exist in the form of starch, gum, sugar, manisite, ulmic, gallic, acetic, malic, citric, and other acids, and neutral substances. In a word, they form the basis of the almost endless variety of organic compounds which modern chemistry has brought to light.

2nd. *The special food of vegetation.*

It might have been thought that the above mentioned substances would have sufficed to give stability and solidity to plants, especially as carbon forms such a large proportion of the vegetable tissues. If even this had been possible, the framework of a plant is not exclusively composed of carbon, certain alkaline and earthy matters being always found to be present along with the organic portion of vegetation. The difficulty exists in the varying proportion in which these alkaline and earthy substances are found, not only in different plants, but in even the same species when grown upon different soils. They are, to a certain extent, interchangeable amongst each other, so that it is difficult or impossible to say which of them are absolutely indispensable to vegetation. It is even possible to imagine a plant *existing* without any of them, in the same way as a mammiferous animal may live after all the solid portions of the bones have been removed. In both

cases, though life might be maintained, neither the animal nor the plant could fulfil their destined uses. Besides the materials necessary to support life, as oxygen, water, carbon, &c., there are, therefore, others, which though of less importance, are necessary to enable plants, as well as animals, to arrive at full perfection. It is, therefore, of importance to ascertain how these are introduced into vegetation.

The plant lives and grows by absorbing into its substance the various gaseous elements that exist in the atmosphere and the soil. The water absorbed by the roots contains, in solution, a considerable quantity of the alkalies and earth: drawn upwards towards the extremities of the plant, this solution is evaporated by the leaves. The various solid matters which are thus introduced, after passing through a great number of chemical changes, are then by the flow of the sap dispersed over the plant. Are we, then, to consider these substances as excretions which the vitality of the plant is able to carry no further, or are they essential to the organization of this plant?

ON THE FECUNDITY OF ANIMALS.

"I see a mighty arm, by man unseen,
Resistless, not to be controul'd, that guides,
In solitude of unshar'd energies,
All these thy ceaseless miracles, O world!"

C. LAMBE.

—ubi temperiem sursere humorque calorem
Concipiunt: et ab his oriuntur cuncta duobus.

OVIO MET., lib. 1., fab. xi., 15.

SIR.—It must give us a very exalted idea of the wisdom and goodness of Divine Providence, if we contemplate how regularly all animals come into existence at the time when the food most requisite for their nourishment is in perfection, or that which supplies their parents with food for them till they are able to provide for themselves. Though the periods of gestation and seasons of love differ considerably among the quadrupeds that feed upon grass, however, the females uniformly bring forth in the latter end of Spring, or in the beginning of Summer when the herbage is tender and luxuriant. The mare brings forth her young in May, after eleven months' gestation. Sheep and goats come in season in the end of October, or the first days of November, and five months after produce, when the grass begins to spring—though the times of gestation are the same in all latitudes, the seasons of love and time of delivery vary with the climate; for instance, in Italy, sheep conceive in June or July, and bring forth in November or December, when the grass in that country is in its greatest perfection, it being burnt up in April, and sheep having nothing to browse on then but shrubs. Beavers copulate about the end of Autumn, and bring forth in January when their storehouses are full of provisions. Birds come forth when the food

they delight in is most abundant. Caterpillars of every kind are never hatched till the leaves they feed upon have grown. The very number of the teats in most of the *mammalia* are the same species, and if they be more or less, it is for some wise purpose: thus, the cow has four milk-paps, and, generally only one calf, but Providence designed the superfluous supply for the good of the human family. The sow has 12 teats, though she often brings forth more than twelve young, but the surplus is also destined for the good of man; and I may observe, with Pliny, that of all meat pork is the most savoury; "there may be distinguished in it," says he, "up to fifty relishes." It is also very abundant; for in every country, as Bernardin remarks, "that which is best is always most common." I often wonder that when there are so many plants and animals exhibiting harmonies and proportions so beautiful, and proofs so evident of a Divine benevolence, that people should collect or preserve shapeless abortions, or monsters; such sights are sufficient to awaken in young minds doubts respecting the intelligence of their Author: "and show as much want of taste and unfairness in their collectors, as in one who should go into the workshop of a founder, and pick up the figures which had been accidentally mutilated—the babbings over the melting pot, and the mere metallic moulds, which might be scattered about, and triumphantly display them, as a proof of the artist's blundering ignorance. The ancients burnt their monsters, but we preserve them in spirits of wine. We resemble ungracious children, who watch their mother in the hope of surprising her in a fault, that they may arrogate to themselves a right to do what they please."—See Dr. Hunter's *Translation of St. Pierre's Studies of Nature*, vol. i. p. 217.

But I will not dwell on this subject; my design at present is, to lay before your readers a table of the ages at which the males of domestic animals are fittest to engender, and the females to produce their young; the number of years they continue fruitful; their periods of gestation, &c.; according to the results of observations made by the best ancient and modern naturalists.

Some of the above results, according to many writers, do not answer this country. For example, they say that July is too late for the copulation of the cow, and that June would answer better, in order to have calves and milk earlier in the year. However, this depends greatly on the season, the growth of grass, or the purpose for which cows are kept, whether for dairy or domestic uses. In the latter respect, it is justly said, that "Milk never comes out of season."

For Leicester and Cheviot ewes, October is a good month to admit the tup. The number of years that cows and bulls continue fruitful might be extended two or three years beyond that given in the table, especially in the valuable breeds.

From observations, made by Lord Spencer, on

the periods of gestation of 764 cows, it appears that 220 days was the shortest time at which a live calf was produced—313 the longest; but none lived that were born earlier than 242 days; 314 cows calved before the 254th day; 310 after the 255th day. So the cow may be said to go 284 or 285 days, according to his remarks.

M. Teissier records the following results from his notes on the gestation of the cow, viz;—

21 calved between the 240th and 270th day, the mean time being 259½.

544 calved between the 270th and 299th day, the mean time being 282.

10 calved between the 299th and 321st day, the mean time being 303.

Therefore according to him, between 9 and 10 months may be assumed as the usual period, though with bull calves cows go generally about 41 weeks—some days less with heifer calves. Mr. C. Hillyard, of Northampton, allows 9 calendar months and 9 days for a cow; 20 weeks for a ewe; 16 weeks for a sow; and 11 months for a mare. The males of all animals (horses excepted) are larger than the females, more especially if they be castrated. Twins are now more frequent than they have been formerly.

BONE-PREPARATION FOR MANURE.—

There are three processes now in use for reducing bones to the crumbly or powdery state fit for manure: 1. Grinding, by which the harder parts are not often reduced much within a quarter of an inch in diameter: 2. Mr. Blackhall's steaming process, by which they are rendered tender and porous, and particularly suited for the action of acid to make the superphosphate. 3. Fermentation in heaps, with earth, sand, or saw-dust, introduced by Mr. Pusey, wherein ammonia being generated the bone acquires some of the qualities of guano; but is rendered unfit for the action of acids, which ammonia would neutralize. It becomes, then, an interesting question which of the three is the most practically effective and eligible. Mr. Pusey's has the advantage of requiring no apparatus, and no great skill; so that it may done by almost any farmer at home; if the waste of ammonia is duly prevented, it will have the effect of a mixture of bone-dust and guano—a result of some value, now that guano is so much in demand, and so largely adulterated. Mr. Blackhall's product is the neatest, and as fit for the action of the acids in the soil as of the sulphuric above mentioned. But how it competes in point of economy with the old process of grinding; how the fermented bone competes with the superphosphate in fertilizing power; and how three kinds, crushed, steamed, and fermented, compete in cost and effect, without addition of acid, are questions on which light may be thrown by successive reports of the experiments now in progress in England, Scotland, and Ireland; likewise, if the experi-

menters will favour us with such reports from time to time.—J. PRIDEAUX.

CARROTS.—In the autumn of 1848 I selected a border in the garden, and dug it as deep as possible, and covered it with sand and leaf mould, to the depth of ten inches, and then trenched it up, so as to mix the soil with the sand. At four different times in the autumn I gave it a complete soaking of liquid manure, viz., cattle's urine. In the spring I put on a sprinkling of wood ashes, and pointed it lightly in. I sowed it with Altringham Carrot seed on the 14th of April, 1849. After they were well braided I used nitrate of soda, and urine, three times in the course of their growth, and in the following October I lifted a beautiful crop quite free from disease. This year I have a crop almost free from wireworm. They were sown on the 23rd March, on the same land as last year, and treated in the same manner. In the autumn I tried a part of the land with dung manure, in order that I might see if it would produce as healthy a crop as that treated in the other manner, but they mostly failed.

In my own opinion the land should be made very strong with liquid manure, previous to putting in the crop, so as to make the Carrots rush quickly up.

ALEXANDER G. CUNNINGHAM.

Rosebank, near Currie.

THE DUST OF DEAD MEN'S GRAVES.

BY EMILY VARDELL.

The ashes of the smouldering oak
To men no history tell
Of how in by-gone years it grew
Luxuriant and well.

They speak not of the cummer breeze
That through its branches strayed,
When lowing herds and fleecy flocks
Reclined beneath its shade;

Nor state they how the woodman came
And cast a glance around,
Beheld the monarch of the field,
And felled it to the ground.

So, too, the dust of dead men's graves,
How voiceless and how mute;
How all unknown its ancient fame,
Its credit and repute;

The dust within the lone church aisle
The sexton sweeps away,
Was it of Prince or Peasant born
In life's momentous day?

The whirlwind wafes it mid the tombs,
Nor eanst thou tell—Oh; man—
Which is the fine patrician flour,
Which the plebeian bran.

August 21, 1850.

Agricultural Journal

AND

TRANSACTIONS

OF THE

LOWER CANADA AGRICULTURAL SOCIETY.

MONTREAL, OCTOBER, 1850.

We have been at the Agricultural Exhibition which took place at Niagara on the 18th, 19th and 20th of September last, and were highly gratified at having an opportunity of seeing an exhibition of numerous specimens of the agricultural and industrial productions of Western Canada. These specimens were very creditable to that fine portion of the Province and afforded ample proof of the capabilities of the country, and of the skill and industry of its inhabitants to make the most of their advantages. The exhibition of neat-cattle, sheep, and swine was good. Of the first there were several varieties, Durham, Devon, Hereford, Ayrshire, and what was termed "Grade Cattle." There were several specimens, both male and female, of each of these breeds, proving that Western Canada has already at her disposal the means of improving the stock of neat-cattle. The sheep were excellent and of the most approved breeds, including Leinster, South-Down, Merinos and mixed breeds. The swine were of many breeds and crosses, but upon the whole were very good. When good breeds of neat-cattle, sheep and swine are already in the country there cannot exist any difficulty of improving the stock of the country, and in a very short period, particularly so far as regards sheep and swine, that increase so rapidly. The horses, although of large size, were not of that description that we would prefer for agricultural purposes. A sufficient size, and strength, may be combined in horses, with lightness, and activity. The great heavy horses that are employed in England in the waggon and dray, are not the most suitable for Canada. Smart, active horses, of

moderate size, will answer best for almost every purpose on a farm. What is known as the "Canadian horse" of Lower Canada when of sufficient size, cannot be excelled for agricultural purposes, by any horses we have ever seen on this continent. They are strong, active, and enduring, and not so liable to diseases as other breeds of horses, indeed they appear to be the breed exactly suited for farmers in Canada, so far as we are capable of judging. The samples of wheat exhibited were excellent, but of other grain we did not see any that were of extra quality. The specimens of roots and vegetables, were of fair quality, but certainly not equal to samples we have seen in Eastern Canada. Of fruits, with the exception of peaches, we have no doubt that we can show as good, the produce of Lower Canada, as any exhibited at Niagara. There was a good show of Agricultural Implements manufactured in Upper Canada, and from the United States. Those manufactured in Canada were generally superior to those from the United States. We were rejoiced to see so good a show of Implements, the manufacture of Upper Canada. It is most desirable that such manufactures should be encouraged by every farmer in the country, who should not purchase a single implement of foreign manufacture, if they could be had and of home manufacture of a good description, and at a fair price. We hope that the Implement makers of Lower Canada will be able to enter into an honorable competition with those of Upper Canada at the great Exhibition in October next, and that they will not be classed second to them in any article they exhibit. The exhibition of domestic manufactures was very creditable, particularly in the article of blankets. We do not recollect ever to have seen better blankets than two lots of those exhibited at Niagara. They were of fine wool, heavy, and of beautiful texture, colour, and softness of feel. No country could produce a better article in the shape of blankets, and we hope that when articles of such a superior des-

cription can be manufactured from Canadian wool they will preferred to foreign manufacture.

Some superior cheese was exhibited, one weighing about 300 lbs, made by a Mr. Ranney from the milk of 65 cows for two days milking. We had the pleasure of conversing with this intelligent farmer, who appears to understand perfectly the economy of the dairy. He informed us that he made about 150 lbs of cheese daily, from the milk of 65 cows, a very fair produce. In the article of cheese we maintain, however, that Lower Canada produces some as good as any we have seen in Upper Canada, and in butter the lower section of the Province is fully equal to the upper, in good samples, though not perhaps in its general produce, but this inferiority whenever it exists, is altogether owing to mis-management of the dairy, and can be remedied by any farmer, who adopts the proper means that are in his power constantly. We learned from dairy farmers, that cows of mixed breed, not over large, were considered best for dairy purposes, and produced the most milk, cheese and butter, during the year. We had an opportunity of seeing the ploughing match. The horses, harness, and implements were good, and the work was generally well executed. The furrow slice was of good proportion in depth and width, so essential to good ploughing. Ploughing Matches are a very useful part of Agricultural Exhibitions, as good ploughing is so necessary in all good systems of husbandry. A very correct idea may be formed of the state of Agriculture from the manner in which ploughing is executed, and if well executed at ploughing matches, it shows that there are good ploughmen in the country, who can show a good example, and prove the advantage of good ploughing. The favourable results, obtained from good ploughing, are the best recommendation to its general adoption. The principle object of our visit to the Exhibition at Niagara, was to see the Agricultural, and Industrial productions of Western Canada, and

endeavour to compare them with those of Eastern Canada, and report the result for the consideration of readers of this Journal, to form their own conclusions. We regret we had not time to see more of the country, as well as the Exhibition, but upon the whole we hope we have it in our power to submit a report that may be useful, so far as to help to reconcile the farmers of Lower Canada, to their own position and circumstances, and to convince them that in neither are they much inferior to their brother farmers of Upper Canada. The staple produce of Upper Canada appears to be wheat, and the chief object of the farmer, so far as we could learn, is to produce large quantities of this article. This is the best thing they can do, and accordingly cultivate well, and judiciously for this crop, the seed for which is sown in the Fall. We hear constantly, of the fine wheat produced in Upper Canada, and what an advantage it is to the farmer, in that section of the Province over the farmer of Lower Canada. This matter, however, is not properly considered. If superior crops of wheat are produced in Upper Canada, the cultivation is superior, and the expense is much greater than is incurred in Lower Canada. Summer fallow, with manure, is the general preparation in Upper Canada, and this requires two years use of the land. In Lower Canada, on the contrary, the soil is generally only once ploughed, in the Fall without manure, and the seed sown in the Spring. The crop in Upper Canada may be much larger than in Lower Canada, but the expense also is much greater in producing the crop. This extra expense of two years employment of the land, with three or four ploughings, if summer fallowed properly, and the manure, if applied which it frequently is, reduces the profit of even a large crop very considerably, and we have little doubt that a fair Spring crop raised in Lower Canada, if not seriously injured by the wheat fly, would leave as much actual profit to the farmer, as is obtained upon an average crop of Fall wheat in

Upper Canada. There is a further item to be considered, that wheat sells generally for a higher price in Lower than in Upper Canada, in consequence of the expense of transport to a shipping port. There has been a great drawback to farmers in Lower Canada for the last 15 or 16 years, which has generally checked their progress, and which the Upper Canada farmers were not subject to. The ravages of the wheat fly in Lower Canada, prevented the cultivation of wheat in a great degree, while the farmers of Upper Canada continued to grow wheat successfully all that time with scarcely any injury from the fly.

This has produced a great difference in the circumstances of the two sections of the Province. The loss sustained in the Lower Section by the wheat fly cannot be much short of eight million pounds currency, and perhaps a larger amount. We readily admit that we should prefer the mode of growing wheat in Upper Canada, as it secures a better cultivation of the land, and must necessarily produce a better condition of the soil subsequently. As to actual profit, however, should we be able to raise Spring crops of wheat in Lower Canada, as we now hope we may, by proper precaution we have no doubt whatever that they would be as profitable as the Fall sown wheat of Upper Canada. We are further almost certain that we could grow Fall wheat in Lower Canada by preparing the soil by summer fallowing, sowing in time, and in drills. The sowing in drills might be done without a regular wheat drill. The land after receiving the last ploughing, should be harrowed, and then with a very light plough or with an iron plough with the mould board taken off, and with one horse, shallow drills might be made along the ridges, about 10 inches apart, the seed might then be sown broad cast, harrowed with a light harrow length wise, which would bring almost all the seed into the drills. The land should not receive much harrowing after the seed is sown, but allow the intervals between the drills of wheat to be higher

than the drills. By this means there is a shelter for the young plants, and in the Spring the soil is wasting down as sort of dressing to the wheat in the drills, and thus preventing the plants from being raised out of the soil by the action of thawing and freezing. The land should be left as dry as possible, by furrow and other draining. Barley, oats, peas, potatoes, and other root-crops, hay, and pasture may be produced fully as good in Lower as in Upper Canada. Fruits, (with the exception of peaches) and vegetables of every description, are as good, if not better, with us, than in the Upper Section of the Province. We have heard it asserted that the beef, mutton, and veal, of Western Canada are better than in Eastern Canada. We visited the market of Toronto, and did not see any proof of this being the case. Perhaps we have more of inferior meat in our markets, than is to be seen in those of Upper Canada, but we certainly have as good beef, mutton, veal, and lamb in Montreal, as we have seen in any part of Canada, and if we have any that is inferior, it is the fault of the farmers who do not pay due attention to their feeding, and is not attributable to any inferiority in the soil or climate of Lower Canada, more than of Upper Canada. The fowls with us are much better than any we have seen in any other part of North America. We have thus fully submitted our humble ideas of the relative capabilities and productions of Upper and Lower Canada. We had not sufficient opportunity of seeing the country to compare the general quality of the lands, with those of Lower Canada, or the general system of farming. There may be some of the lands of Upper, superior to those of Lower Canada, but we did not happen to see any of them. The general system of farming may also be better than our general system, and we are sure it is, and is more calculated to keep the soil in a constant state of fertility, but we unquestionably have some as good farmers in Lower as in Upper Canada. There is another circumstance in favour of the Upper

section of the Province, that a large proportion of emigrants coming to Canada with capital and other means settle in Upper Canada, and commence farming at once with ample means to carry it on successfully, while very few of them remain in Lower Canada. These are very great advantages to a new country. The most skilful of emigrant farmers, and farm labourers also proceed to Upper Canada at once. All these causes act in favour of one section of the Province above the other. We cannot speak of the general quality of domestic animals, compared with ours, but we believe those of Upper Canada are superior, from more careful management. Swine particularly, of a good breed, are more general there than here. We take upon us to state distinctly, that every defect in our state and circumstances is capable of remedy, if we chose to adopt it. There is another circumstance which is highly favourable to Upper Canada, and that is, the most respectable of the community take a lively interest in Agricultural affairs, and regard Agriculture as the basis of their prosperity. This we could readily perceive at the great Dinner at Niagara, as well as from conversations with gentlemen we happened to meet with. The farmers also, appear to take a greater interest in their business, and in what would promote its improvement and prosperity than with us.

We must not omit to state that farmers as a class, are better educated in Upper than in Lower Canada, and this circumstance has a most favourable influence upon the husbandry of the former country. An educated man is more ready to receive and adopt improvements proposed to his notice, than an uneducated man, who has generally a prejudice against any changes, and a high opinion of his own skill in agriculture.

Upon the whole, our visit to Upper Canada has by no means diminished our estimation of the capabilities of Lower Canada, as compared with any part of North America that we have seen, and we have no doubt that Lower Cana-

da might be made as abundant in agricultural products as Upper Canada, or the neighbouring States. The means that are necessary for the improvement of the country are in the power of the Legislature and the people, and we deny that the climate or soil of Lower Canada are unfavourable for successful agriculture.

AGRICULTURAL REPORT FOR SEPTEMBER.

THE month was fine throughout, and afforded farmers a most favourable opportunity to complete the harvest, and house their grain in the best condition. The harvest, altogether, has been one of the finest we have seen in the country, and there has not been any waste of either labour or produce. The advantages of fine harvest weather, cannot be too highly estimated, and upon an average, we have more favourable harvests here than in the British Isles. Wheat, we believe, is a fair crop, and has not suffered much from the fly or by any other injury, from the first appearance of the ear. The plant may have been thin in many instances, from various causes—such as want of fertility in the soil, insufficient cultivation, and draining, wire-worm, and slugs devouring the plants, &c., but the season has certainly been very favourable for wheat where justice has been done to its cultivation. For all other grain crops it has been equally favourable, and there is every reason to hope the returns from barley, oats, peas, beans, and indian-corn, will be a fair average. The quantity of barley grown this year is not so large as usual, but it may be equal to the demand and consumption. All these grains have a right to be sound and well got in, the harvest has been so continually dry. There have been various reports of the potato crop—and of the appearance of disease in the tubers. We have seen potatoes taken up that were very much diseased, but to what extent the crop is generally affected we cannot pretend to say. The fine weather during the month of September was calculated to check the disease.

We have seen the vines or tops very suddenly blackened, without any frost to produce this change, and in fields that were not planted early, and were not nearly at maturity. This must be produced from an unhealthy state of crop, as no such change ever took place in the potato crop, previous to the appearance of the disease, unless it resulted from frost, or the maturity of the crop. The disease in potatoes is an unaccountable visitation, and has never yet been satisfactorily explained. The best prevention of disease is to plant early in dry soil, only applying special manures, such as ashes, soot, charcoal, salt, lime and gypsum. It is very essential to their preservation for the winter, to have them well dried before they are stored. We have seen it recommended to place them in small heaps in the field, about a bushel in a heap, cover them with the soil—and leave them in this way while the weather is fine, to season and dry. It is a troublesome mode of proceeding, but if it would prevent the rot, it would be well to make the experiment. There are some varieties of the potato less subject to the rot than others, and such ought to be cultivated. Those of the driest quality are the least liable to disease. When in Upper Canada about the 20th of September, it was reported that the potato disease had commenced very generally. In storing potatoes for the winter, the hulls of oats taken off for making meal, is a good substance to mix with them, and they should not be put up in too large quantities together. A moderate temperature, very little over the freezing point is the best for potatoes, and all root crops. For carrots, parsnips, turnips, and beet, the temperature should not be much over freezing, during winter—and they should be made up in the root houses in separate piles with alleys between to give them air, and there should be constant ventilation. The aftergrass and pastures are very green though we have not much rain. The market is well supplied with butter, cheese, butcher's meat, and vegetables in abundance, and all at moderate prices. The

price of hay is from 25s. to 30s. the 100 bundles of 1600 lbs., and of straw from 15s. to 20s. the 1200 lbs. These prices will probably be kept up, and it would not be for the interest of any party that they should not. The land is not yet generally in the best order for ploughing. It requires some more rain for strong clay land to make it fit for ploughing. Now is the time for draining, and putting the ploughed land in good order for working in the Spring. In land intended for summer fallow, it might be sufficient to make it into a sort of drills, ploughing only half the soil, by what is known as ribbing. This rots the soil, and exposes it to the action of the frost. In Spring these drills may be harrowed down for ploughing cross wise. In many situations, the mixing of soil by the plough may be expedient, but this must be left to the farmer's judgment. If the surface is different from the subsoil, and would be likely to improve it by mixing, it will be well to allow one plough to follow another in the same furrow—not a subsoil plough, but a common plough if it can do the work. It might be necessary to have the share of the second plough not so broad as that of the first, but if the object be to mix the soil, it is better to have a common plough to follow the first, than a subsoil plough. The second plough may require more power than the first. The mixing of soils *judiciously*, is one of the best modes of improvement in the farmer's power, and is permanent. By this mode a soil may be changed altogether, and made much more fertile. Moss is a good substance to mix with clay or sandy soil, as clay or sand is good to mix with moss soil. It is a good plan where moss is convenient, to cover the farm yard with it at this season of the year. It will imbibe the liquid manure, and all the soaking from the farm yard manure and will make a good dressing for land in the Spring, or may be mixed up with the dung. It is a good substance to put into compost heaps with lime, ashes, gypsum, &c. In making drains we would again recommend to

take off the slopes, in the proportion of at least two feet wide at top to one foot in depth, and not have the drains more than the width of the shovel at the bottom, unless a large quantity of water has to be discharged. Every farmer who has the means should slope his drains, as it will save much labour for the future, and give a much better discharge for the water. Drains cut almost perpendicular, are very likely to be inefficient when most required. The frost of winter, and thawing in Spring is apt to cause the sides to wash in, and damage the drain when its free action is most required. As draining is most essential to good farming the drains should be kept in the best order constantly. We cannot say what prospect there is of prices but it is probable they will not be very low for grain, at all events not under the prices of last year, but perhaps over them.

30th. September.

The approaching Industrial Exhibition to take place at Montreal, the 17th, of October, is expected to be very creditable to the country, and there is little doubt that we shall have an Exhibition that will not be surpassed in North America. Indeed we are perfectly certain that we shall have some articles manufactured in Montreal that will do the country credit. Perhaps, however, it would be too much to expect that any articles of our produce would enter into successful competition with English products. All we can reasonably expect at the Great English Exhibition would be to show respectable samples of the products and industry of Canada, that would give an idea of the capabilities of the country. These samples, we hope, will show that this Province is one of the most valuable appendages of the British Empire, and one that offers the greatest encouragement to immigration, and the safe investment of capital. The Exhibition, we have no doubt, will prove beneficial to this country, and show it in a very favourable light to our fellow subjects in England. This country is not properly

known in England, and it is most extraordinary that parties who ought to know our country, are apt to mis-understand, or mis-represent it. We have heard a gentleman, travelling in Canada say, we had no good vegetables here, particularly cauliflowers. He goes to England and makes this statement, and of course those who hear him, conclude the country is not fit to live in, as good vegetables are highly prized by Englishmen. Now any one who has resided in Montreal for any time must know that we have the very best description of vegetables, and in great variety, and cauliflowers in the greatest perfection. Our beef, mutton &c., is also said to be not equal to that of England, but we certainly have constantly a supply of as good beef, mutton, lamb, and veal as in any country, not, perhaps, so fat as that of England, where a large portion of the fat goes to make soap and is only worth about the fourth part of what it cost the farmer to produce it per pound. The over fattening of animals, is now, however, discontinued in England, except occasionally to show what beasts may be brought to weigh. Canada products of every description are good, we only want to have them in greater abundance. We were rejoiced to see, this year, excellent cheese of Canadian make, equal to any we have ever seen of American manufacture. And when this can be done in the country by one farmer, it may also be made by others, who adopt the necessary means. We have as good butter here as in any country. What then are we deficient in. In the products of agriculture? We may, and we have inferior articles certainly, but this results from want of skill, and careful management, that may be remedied. We hope the Industrial Exhibition, here and in England, will place matters in a new light, and show our friends at home, that although this was a country of forests, of frost, and snow, it is now one that produces almost all the necessaries of life in a very respectable degree of perfection, and in proportion to the skill and industry employed for their production. Even in Upper Canada

there is a general mistake with regard to Lower Canada. We have been asked how any farmers could succeed in it, when we have eight months of winter, of frost, snow, and bad weather. If it was the case it would undoubtedly be very difficult for farmers to succeed, but it is not so, and we feel persuaded that we are not so subject to frosts at unseasonable periods of the year, when they are injurious, as they are in Upper Canada, nor are we so liable to long droughts, and heavy falls of rain. The general temperature for a year is higher at Montreal than at Toronto by several degrees although our winters are colder than at Toronto. We believe on an average of years our hay crop is better here than in the Upper Section of the Province or in the United States. From all these considerations, we have every reason to be satisfied with our country compared with any other on this continent.

On a recent visit to Quebec, we had the honor of an interview with his Grace, the Archbishop of Quebec and his Lordship, Bishop Turgeon, who received us in the most kind and condescending manner—made numerous inquiries as to the state of Agriculture, and the best means for its improvement, and graciously assured us they would do all in their power to forward its improvement. The Archbishop had already addressed a "Circular" to his Clergy, recommending them to favour Agricultural improvement, and to support this Journal, and this "Circular" was productive of much good by its influence with a large portion of the Clergy and Laity. It is very gratifying to find that the heads of the Roman Catholic Church take a lively interest in this matter that is of such vast importance to the Canadian community, and there is every reason to hope that through their influence, the Lower Canada Agricultural Society will be able to effect much good, and by degrees carry out the object for which they were organised, and Incorporated by the Legislature. The worthy secretary of the Archbishop, the Rev. Mr. Cazeau, is also

a most zealous advocate for Agriculture, and we heartily wish all other Clergymen were influenced by an equal degree of zeal in so good and honorable a cause. We rejoice to acknowledge the support of several other Clergymen, who, however, might not be pleased to have their names mentioned. We humbly presume that it is not inconsistent with the sacred calling of the Clergy of any denomination to aid and countenance the improvement of Agriculture. We beg leave to offer most respectfully our sincere acknowledgements to His Grace, the Archbishop of Quebec, and His Lordship Bishop Turgeon, for their very kind and flattering reception on the occasion of our interview, and for the interest they manifest in the cause we have humbly endeavoured to advocate.

We had an opportunity recently, of seeing a large portion of the grand water communication that connects the Atlantic ocean with the vast lakes of Upper Canada, and it certainly is a work to be proud of as Canadians. To Upper Canada in particular it is of vast importance, increasing the value of all that farmers have to sell; and diminishing the price of what they have to buy in consequence of the cost of transport being diminished, we suppose, three fourths or more. We should have been unworthy of this fine country and these great inland seas, if the St. Lawrence and other canals connected with it had not been completed on their present scale. It opens a vast country for settlement and production, that would otherwise be comparatively of little value. Upper Canada is a great gainer by these noble works, and she certainly has excellent means of communication already, in all directions. These means of communication are admirable from their great capacity for carrying bulky produce, lumber, &c., for more than 1000 miles inland, to the ocean. No country on earth had such means of communication provided for their people.

The old settled parts of Lower Canada are not so well provided with means of commu-

nication, and we hope this may be looked to, as this want will greatly retard the advance of improvement. There are many of the rivers of Lower Canada that we believe might be made navigable for small steamers for a moderate outlay. This would be very desirable. Nothing would tend more to advance improvement than ample and easy means of communication to all parts of the country. It would induce the farmers, to improve their lands, and raise a large produce if the market were of easy access to them. They would see that it was their interest to raise a large produce when they could dispose of it. They would also come out of their back settlements, and see the progress of improvement near our cities and towns. There cannot be any doubt that travelling, and seeing the country, has a great tendency to remove prejudices that we are apt to imbibe when we never see anything but our own farm, and our own management. Travelling gives an opportunity of comparing other farming with our own, and he must be a very good manager indeed if he does not discover some errors in his practice when he sees the practice of many others.

We have seen a report of a trial which took place in England lately, with wagons and carts in taking in a crop of wheat and oats from the fields to the stack yard. The trial was made on two different fields, and where the access to the fields was hilly in one case, and not so in the other. The distance was from half a mile to a mile. There were 5 carts with 5 horses, and 5 wagons with 10 horses. The attendance of men and boys to each was equal. In both instances the carts finished their work before the wagons had done theirs. The experiment was made in the presence of several respectable witnesses. We have been always persuaded that carts are more convenient in a field in harvest than wagons. The wagons are too heavy, and not so easy to manage in a corn field, particularly if the land is not very hard and dry. The hay cart of Lower Canada is

the most convenient and efficient machine we have ever seen for carrying in the harvest, and we were quite surprised to see that they have not been introduced in Upper Canada, but it only shows how much parties are prejudiced in favour of what they are accustomed to, even though they should not be so good or convenient. The Canadian truck we did not see in use in Toronto, but we did see carts that we humbly conceive bear no comparison to the truck in usefulness and convenience. We may be thought to be wrong in our estimate of the hay cart and truck of Lower Canada, but we should certainly be glad to see them fairly in competition and their merits and convenience fairly tested in every possible way. The hay cart is more easy to fill, and is not so top-heavy when filled as a frame cart or wagon. Hay-carts frequently carry with one horse, one ton of hay to the Montreal market, but 100 bundles or about $\frac{3}{4}$ of a ton is quite easy to put on when required. These large loads, however, are not necessary, on the road or in the field, and moderate sized loads are much better. A truck can carry conveniently 8 barrels of flour, and one man can easily manage it. They frequently carry a ton weight, and for iron or almost any article, the truck is perfectly convenient. We hope whatever changes may come, we shall never see Lower Canada without the hay cart and truck, and good Canadian horses to draw them.

We copy the following articles from the North British Agriculturist, relative to the wheat fly or midge. It corresponds so exactly with what we have known of the habits of the insect in this country that it is as applicable to us as to the Carse of Gowrie. As the writer observes it is most extraordinary, that the habits of this fly are not known to every farmer who pays any attention to the progress of his crops. We see it is the same case here, they call it the weevil, which is altogether a different insect and never injures the grain until it is in the granery. We have constantly watched this

insect, and the article we now copy is a most exact report of its habits in Canada. One side of the ear is destroyed, while the other remains untouched, because the other side remains partly covered for a few days when the ear is first appearing, and the fly cannot injure it until the grain becomes too hard for it. We have seen by reports from various sections of the British Isles, that the wheat fly has done considerable injury to the wheat, and in numerous instances it does not appear that farmers understood what has injured their crops, some attributing to a blast, red gum, &c. &c.

WHEAT MIDGE—CARSE OF GOWRE.—The deficiency in wheat caused by the larvæ of the wheat midge is not great on an average of the whole district. Some fields are not a little deficient from this cause; but their numbers are few, and many fields have entirely escaped. This resulted from the stormy nature of the weather in June, when the ears were bursting their sheath the high winds forcing the delicate midges to take shelter amongst the foliage till the ears were fairly past danger. Those fields that have suffered happened to be just showing ear on one or two mild evenings when the insects were able to ascend. On one of these evenings the large number of 40 midges were observed on one ear, some of them busy depositing their eggs on the upper part of the glumes. The circumstance that one side of the ear is generally attacked, while the other remains safe, gave rise long ago to the notion that the insects were produced by equivocal generation and appeared subsequently to easterly fogs; the side of the ears facing the east having been observed in some instances injured, while no larvæ were found on the glumes on the other side. This and many other foolish notions were entertained by some of our Carse farmers in 1827, and the two following years, in which years it was estimated that the injury done by this insect cost the farmers in this district £90,000. Such opinions are now no longer entertained here, for our farmers have had too many opportunities of studying the habits of the insect in its various stages. It would seem, however, from paragraphs and reports in newspapers, that farmers in many parts of the country are even now but entering on an acquaintanceship with this small, delicate, yet formidable insect. Some talk of sifting the larvæ and pupæ from amongst the grain on the barn floor, not knowing that the wheat midge, *Cecidomyia tritici*, and the insect that infests wheat in granaries, are entirely different insects, not even belonging to the same genus. When the larvæ of the wheat-midge have done their work, they immerse from the

glumes on a fine sunny day, when these burst open by their natural elasticity, and then, gathering their two ends together, spring from the ears and immediately dig about an inch or so into the soil, and pass the winter there in the pupa state. The pupæ are all safe below the ground about a month before harvest. By using a skim coulter in winter-ploughing, the pupæ may be buried too deeply to allow of the midges coming up next summer; but even where this has been done, and beans sown next season, the midges have found their way to the surface by ascending between the bean roots and the soil around them. A mean temperature of 56 degrees for a week in the beginning of summer brings the insect into the fly state, and it hovers about the field where it found its winter quarters, till the wheat in neighbouring fields begins to show ear, when it is directed towards it by the organs of smell. By collecting a few of the pupæ from the soil in autumn, a flock of midges may be had from them in mid-winter, by imitating the requisite natural temperature artificially. The larvæ found in the envelope of any one grain are produced from the eggs deposited therein, and the insect in the larva stage does not go from grain to grain. Before speaking of plans to guard against this, or any other insect, its habits should be studied. Could anything be done by spreading quicklime between the drills of wheat just at the time when the larvæ are ready to descend from the ears and burrow in the ground? or would a layer of salt, soot, or other material pernicious to insects, prevent their burrowing?

It is very strange that they do not appear to be generally acquainted with the wheat-fly in England, though it appears that the insect has done considerable damage there this year. The following extract of a letter from the *Mark-Lane Express*, gives a description of the larvæ of the wheat-fly and the injury done to the wheat. There cannot be any doubt that considerable damage is done to the wheat crop in the British Isles by the fly, but the farmers do not appear to understand the matter there so well as they do in Canada. The wheat crop of Lower Canada has suffered some injury from the fly this year, but we do not think the injury very extensive. The following is the letter referred to:

Since my communication of the 19th of last month, I have submitted the wheat blight to a microscopic test, and find the animalcula in three separate states:—1st, a caterpillar of am-

ber colour, having many legs, and a horned head, similar to that of the earwig. 2nd, a chrysalis of amber colour, covered with a thin and almost transparent skin. 3rd, a winged aphid with four legs, large head, and broad nose. In the caterpillar form it is only to be feared: in that state it feeds upon the pulpy corn, until it is consumed, when it assumes a chrysalis form at the bottom of the husk, in which state several lie coiled up together to the number of from 4 to 25; in this state they lie from two to four days (according to the weather), when they assume their winged state, and if the day be fine they fly abroad, when, owing to their minuteness, they become lost to sight. However insignificant these animalcula may appear, they have power to destroy all corn they seize in a few days; and had it not been for the continued and heavy rains during the last fortnight, which has drowned and washed away the blight, a fearful loss to the farmer would have been witnessed. As it is, some few ears of wheat are completely lost, some half, some a row, and others single corns.

The following is the number of perches (16½ feet to the perch) of drains in an English acre, at different distances apart, viz:—

At 21 feet apart.....	225 ½	perches
24 do.....	110	do
27 do.....	97 ¾	do
30 do.....	88	do

The best top-dressing for meadow is plenty of good farm-yard manure, or rich liquid manure. The next is bones, dissolved in sulphuric acid, and mixed with rich earth. Guano is excellent, mixed with from 5 to 10 times its weight of rich earth, ashes, &c. Lime is good, but should be mixed some time in compost, with an old head land. If the land is well drained, from 40 to 80 or 100 bushels of lime may be applied to the acre mixed in compost in this way.

NICE WHITE VEAL.—We shudder at the cruelties practised upon Strasburg geese to produce the celebrated *pates de foie gras*; but remorse would assuredly afflict the amateurs of veal with indignation, if they reflected on the tortures to which calves are subject, to cause the very unnatural colour of the meat they so much prize. The natural and wholesome tint of veal is not white, but pink. An ancient French traveller in England (1690) says that the English veal has not the “beautiful red colour of the French.” Dr. Smollett, in “Peregrine Pickle,” upbraids epicures on the scores both of cruelty and un-

wholesomeness, saying that our best veal is like a “frieassee of kid gloves,” and the sauce of “melted butter” is rendered necessary only by the absence of juices drained out of the unfortunate animal before death. The process of killing a calf is a refinement of cruelty worthy of a Grand Inquisition. The beast is, while alive, bled several times; in summer, during several hours of the night, and frequently till it faints, when a plug is put into the orifice till “next time.” But the lengthened punishment of the most unoffending of animals is at the actual “killing.” It is tied together, neck and heels, much as a dead animal when packed in a basket, and slung up by a rope, with the head downwards. A vein is then opened till it lingeringly bleeds to death. Two or three “knocks” are given to it with the pole-axe whilst it hangs loose in the air, and the flesh is beaten with sticks, technically termed “dressing” it, some time before feeling has ceased to exist. All this may be verified by those who insist on seeing the penetralia of the slaughter-houses; or the poor animal may be seen moaning and writhing, by a mere glance, on many days in the week, in Warwick-lane, Newgate-street. This mode of bleaching veal is not only a crime, but a blunder. The flesh would be more palatable and nutritious killed speedily and mercifully. But were it otherwise, and had it been twenty times more a luxury, who, professing to honour the common Creator, would, for the sensual gratification of the palate, cause the calf to be thus tortured?—*Dickens’s “Household Words,”*

M. SOYER’S EXETER PUDDING.—Put in a proper sized basin, ten ounces of fine bread-crumbs, four ounces of sago, seven ounces of suet chopped fine, six ounces of moist sugar, the peel of half a lemon grated, a quarter-pint of rum, and four eggs: stir for a few minutes with a spoon, add three more eggs, four table-spoonfuls of clouted cream, mix well, it is then ready to fill the mould. Butter the mould well, put in a handful of bread crumbs, shake the mould well till the greater part stick to the butter, then throw out the remainder, and have ready six penny sponge cakes, two ounces of ratafias, and half a pound of either raspberry or strawberry jam; cover the bottom of the mould with a layer of ratafias, just cover them with a layer of the mixture, cut the sponge cake lengthways, spread thickly each piece with some jam, put a layer in the mould, then a few ratafias, afterwards some of the mixture, and so on, till the mould is full, taking care that a layer of the mixture is on the top of the pudding. It will take about forty minutes baking. The sauce: Put in a small stew pan three table spoonfuls of currant jelly, and two glasses of sherry, warm on the fire, and pour over the pudding cloth, and serve hot.

THE INTERNATIONAL EXHIBITION.—It is perhaps, questionable whether London ever held so distinguished a position, or whether Britain was ever so truly great, in the sight of all nations, as at this moment, in anticipation of that grand cosmopolitan centralization of the whole world's enterprise, which will virtually elect the capital of England into the commercial metropolis of the nations. For then, without the slightest vestige of a hyperbole, will there be here assembled the representative fruits of the genius and industry of "every nation under Heaven" to do homage to the pre-eminence of the British Empire, as at least the central mart for all, whatever be the result to it in particular, as that "Great Babylon" to which "all the merchants of the earth" will doubtless be devoted till the ominous end of their commercial empire. The several announcements of the intention of many of the more civilized nations on the Continent of Europe and America to take part in the great jubilee or fair have long been made known, as indeed have subsequently those of the less-civilized Asiatic nations—such as the Hindus, Chinese, and Persians. Still more recent announcements are those from Turkey, the Sultan having decided that specimens of Turkish manufactures shall be sent in to the Exhibition; and from Peru, the President of which has issued a decree appointing a commission to select and take charge of the Peruvian contributions. In short, the whole world is astir, and London and its next year's sights are the anticipative subject of that whole world's wonder and expectations, from the present time forth till the grand consummation.—*The Builder*.

EXHIBITION OF 1851.—We understand that a register is about to be opened at No. 1, Old Palace-yard, Westminster, by the Secretary of the Executive Committee for the Exhibition of 1851, in which will be entered the names and addresses of persons disposed to provide accommodation for artisans from the country whilst visiting the exhibition next year. It is proposed to furnish copies of this register of lodgings and accommodation to all the local committees. Other arrangements are under consideration for guiding the working classes on their arrival by the trains, to the lodgings they may select. We believe the register will contain a column, in which the nature and charges for the accommodation each party proposes to afford will be entered.

THE EXHIBITION OF 1851.—The whole of the immense area in Hyde Park, assigned for the Exhibition of 1851, is now enclosed with railings about eight feet high, and men are now busily engaged in staking out the ground for the foundation, which, it is understood, is to be wholly of wood-work. Some notion of the enormous glass-house to be placed on the spot may be judged of from the fact that it commences opposite the

officer's house at the Knightsbridge barracks, and nearly reaches to the first gate of Kensington Gardens, being a length of 700 yards, by about 140 in depth, and extending from Rotten-row to Kensington, to the barracks. As the whole, when sent, will be ready for fixing, it is confidently stated this gigantic structure will be erected by the close of the year.

FLOWER GARDEN AND SHRUBBERY.

According to present taste, a large and well ordered flower garden is one of the greatest trials of skill within the whole range of Horticulture. When at Drumlanrig Castle the other day, we were informed that from 60 to 70,000 pot plants are propagated annually, and kept over the winter for bedding out, besides pounds of this annual and half pounds of the other; and on looking over *The Cottage Gardener* on our return, we find our highly intelligent friend, Mr Beaton, of Shrubland Park, very coolly speaking of putting in cuttings of Scarlet Geraniums in the open borders much in the way ordinary men prick out cabbage plants. He says, "our first stock plant of Geranium is our own Scarlet Seedling called *Punch*, and of it we annually root 5000 cuttings;" and yet he in the same column informs us that his list of Scarlet Geraniums contains 89 names, and to these he threatens this season to add some half a dozen more; verily we may exclaim with Dominie Sampson, "Prodigions!" Nor is it in the vast number of these plants that Mr Beaton cultivates, that our astonishment or admiration is to be entirely arrested; his mode of propagation to secure these results is equally interesting, both in regard to success, and the very simple means employed. Speaking of his favourite *Punch* (and, by-the-by, he has his *Juny* also), he says, "This is the greatest number we strike of any one sort, and it is very seldom we put cuttings of these kinds of Geraniums in pots, unless it is a very delicate or rare sort which we can ensure better that way. The whole are rooted in the open ground, and full in the sun, and the hottest day in the year will not hinder our propagation when we once begin, and we never shade a Geranium cutting. The Vine and Peach borders are generally the propagating beds, and it is a good old plan to put a slight coat of some light rich compost over these borders in July, when most of the liberal waterings are over for the season, the borders being first stirred with a fork to the depth of 2 or 3 inches and then a couple of inches of the mulching compost is added. The whole is then raked, and the usual alley is marked out near the wall, and the place is ready for the cuttings. You begin at one end of the border, and plant the cuttings in rows across it, two inches between every cutting, and six inches between the rows. Care is taken to

keep each sort by themselves by apportioning the ground to the number of each sort required. The following is so wide apart from general practice that we cannot resist the temptation of making the brief extract of it:—"For those who know very little of these things," Mr B. says, "I may now give the details. The border or open space of ground in a very sunny aspect, as we shall suppose, is ready, and I put most stress on having the place full in the sun, because half the world lie under a mistake on this head, and suppose that a north aspect is the best, which is indeed a very wrong notion. Then look over the bed or plants from which the cuttings are to be taken, and select carefully those shoots near the centre of the plants where they are most crowded; and in this early searching for cuttings you are to study 'the look' of the plants rather than the number of cuttings, for if we 'take the market on the day,' we have plenty of opportunities yet for an abundant supply of them. Then, at this early period, be content with a few, if judiciously chosen, and that few will rather improve the look of the plants, and enable them the sooner to extend sideways. The cuttings of strong growing Scarlet Geraniums may be six or seven inches long, as an average; three of their bottom leaves to be cut off and the bottom of the cutting to be a clean cut just under the bottom leaf. Some people say that these cuttings should lie by for a while to dry,, so as that the fresh soil should not 'damp them off;' but this is hardly necessary; the soil is dry enough to suck off any moisture that may be on the cut part, and a cutting in the open ground is not at all so likely to rot as one placed in a pot." The process of putting in, watering, &c., is as usually practised, only care is to be taken not to exceed in the latter. It is probable that many other soft-wooded plants might be struck in the same way. At all events early propagation should not be disregarded.

ASHES.—The following remarks of Dr. Faraday on the subject of Ashes, delivered in his recent Course on Domestic Chemistry will be read with interest:—"One of the points he wished particularly to enforce was the great use and importance of the result of combustion, which was in general regarded as refuse to be thrown away. The ashes which remain after all the combustible parts of the fuel are consumed, may generally be found in the fuel before it is burned, but other parts of the ashes are the products of combustion, and not refuse; and these form an important class of bodies. Taking, however, the term 'ashes' in its general acceptation, Dr. Faraday first showed the value of the mere refuse of our domestic fires, and gave a short history of the processes by which the clearings out of dust-holes are separated and appropriated to various uses. After the separation of the old pieces of metal, bones, skins, and others heterogeneous

substances, the actual ash that remains is employed for manure, and for the manufacture of bricks, for which latter purpose no other material answers so well. The value of the sifted ashes varies greatly, according to the demand for brick-making—the dust contractor being able at times to obtain 20s. per chakron for the refuse, whilst at others he can only obtain one twentieth part of that price. The ashes of plants consist in a great portion of silica, which is found most abundant in the stalks and leaves, and from which they derive their firmness and necessary strength. The amount of silica in wheat straw is equal to 67-90 parts in every hundred, while the quantity in the grain is only 1-18. The silica contained in straw being so abundant it may be rendered visible and converted into glass by heat, as Dr. Faraday exhibited by burning a straw in the flame of a spirit lamp and producing, as the result, a minute globule of glass. The proportion of silica varies considerably in various classes of plants. In rushes there is a less proportion than in straw; but in canes, silica is so abundant, that accretions of the mineral in a solid state are not unfrequently found inside bamboo canes. That class of ashes which are the product of combustion, and not merely the refuse of the fuel, include both soda and potash. It is well known that Sir Humphrey Davy discovered that the alkalies are but the ashes of inflammable minerals, which have such a strong affinity for oxygen, that they cannot, in ordinary circumstances, be prevented from combining with it and burning. The ashes of these minerals are abundant in several plants, and when they are consumed the alkaline ash remains. The vegetable alkali (potash) is derived from the combustion of plants containing it, and Dr. Faraday illustrated the development of that alkali by rubbing some wood-ashes on moistened turneric paper, which became instantly marked with dark brown, indicating the presence of an alkali. By treating the ashes of sea-weed in a similar way, the same effect was produced, the alkali in this instance being soda. That very peculiar substance, iodine, was first discovered among the ashes of sea-weed, as explained by Dr. Faraday, who performed several experiments to illustrate its remarkable properties. He pointed out numerous other instances of the importance of ashes, one of which was the manufacture of glass—an article that is formed entirely by a combination of ashes of various kinds. Among other substances in nature which may be regarded as ashes, he mentioned volcanic lava and meteoric stones."

To find one who has passed through life without sorrow, you must find one incapable of love or hatred, of hope and fear—one that hath no memory of the past, and no thought of the future—one that hath no sympathy with humanity, and no feelings in common with the rest of his species.

TIME OF REAPING.—At a late meeting of the Ulster Chemistry Association, Dr. Hodges gave an abstract of the various experiments which had been made in England, and other countries, to determine the proper method of reaping the grain crops. He said that, though in many places in this country, early reaping was regarded as an innovation on the old rules of sound husbandry, yet, that the practice was not of modern origin, but strongly advocated by the agricultural writers of ancient Rome, one of them remarking that, with respect to wheat, "the later it is reaped the better it casts, but the sooner it is reaped the fairer the sample. The best rule is to cut it down before the grain is got hard, when the ear begins to have a reddish brown appearance. "Better two days too early than as many too late" is a good maxim, and might pass for an oracle. In modern times (Dr. H. remarked), the opinions of the old Roman had been revived, and their correctness proved, both by scientific investigation and the experience of observing farmers. Dr H. continued to give an account of the characters presented by the cereal plants at various periods of growth, and directed attention to the valuable experiments by Dr. Hannam, an experienced English farmer, and also to the analytical investigations lately published by Dr. Voelcker, Professor of Chemistry in the Royal Agricultural College at Cirencester, which had been undertaken at the suggestion of Mr. J. Walker, of Glyn, a member of the Society. Dr. H. urged the propriety of reaping grain at a much earlier period than usually practised in this country, as, at the period of full ripeness, a similar amount of flour and a greater proportion of bran was obtained, and the amount of muscle-sustaining ingredients both in wheat and oats was less than in the grain cut at an earlier period. It has been proved by analysis, he said, that ripe oats afforded only about 15 per cent. of muscle-sustaining matters, while the same kind of oats, cut green, yielded about 18 per cent. It might, therefore, be inferred, so far as present knowledge extends, that the practical rule laid down by Mr. Hannam, of cutting wheat at least a fortnight before full ripeness, should be adopted; and, also, that oats should be cut when the ear has become so firm that no milky liquid can be expressed by pressure on the grain. The Chairman asked, if any experiments had been made to ascertain whether grain was good for seed when cut so green? Dr. Hodges said that no trustworthy experiments were recorded. He would prefer the fully ripe grain for sowing. He trusted that, next year, some of the members would be prepared to give the details of experiments showing the produce and value of the grain crops cut at various periods of growth. Mr. Andrews said that they had been cutting earlier in his neighbourhood year after year. The old popular notion was that "a green shear

was a bad shake." Dr. Orr exhibited samples of wheat and oats cut at different periods, some of which showed how much the ears continued to fill after being placed in the stooks. Dr. Orr proposed, and Mr. Andrews seconded the following resolution, which was adopted:—"That it is the opinion of the meeting that all kinds of cereal grains should be reaped while the pickle is still in a soft and doughy state, and at the time it has ceased on pressure to exude a milky liquid."

PEAT CHARCOAL.—An interesting meeting was recently held at the private house of Mr. Pinney, M. P., of persons interested in the Irish Amelioration Society, a chartered company formed for the purpose of manufacturing peat from the bogs of Ireland into charcoal, partly with a view to afford employment to the Irish peasantry, and partly with a view to profit. We have not much faith in semi-philanthropical enterprises, and we are therefore glad to see that this company's proceedings are likely to succeed on the sounder basis of commercial profit. Mr. Pinney, who is an active director of the society, and Mr. Jasper Rogers, the society's engineer, made statements, and referred to experiments which prove that peat may be converted into charcoal, by the company's patent process, at a cheap rate, that when so converted it furnishes a complete deodoriser for sanitary purposes, and that the charcoal, alone or mixed with nightsoil, is very useful for agricultural purposes. At the same time the company's operations afford much employment in Ireland to the most destitute portion of the peasantry. Nightsoil mixed with the charcoal is quite inodorous, and according to an analysis made by Mr. Nesbit of Kennington, the value of the compound manure is about one-half that of guano. We have at this moment in progress a practical trial of the agricultural value of the peat charcoal and nightsoil manure for turnips, as compared with guano, nightsoil and mould mixed, and manure from cattle fed in boxes. At present the box-fed manure—a heavy dressing—has produced the largest plant; on the peat charcoal manure, and the mould and nightsoil, the plants are as nearly equal as possible, but the expense and trouble of carting, mixing, and laying on the mould and nightsoil were very considerably more than the peat charcoal. The guano is five cwt. to the acre, equal in money value to the charcoal manure, and as yet the plants on the charcoal are better than those on the guano. The peat charcoal, applied alone to potatoes, is said to prevent disease; and as the selling price in Ireland is 35s. per ton, and a comparatively small quantity is stated to produce such important effects, attention ought to be drawn to the subject.—*Economist*.

Envy—punishing ourselves for being inferior to our neighbours.

AMERICAN MODE OF PREVENTING POTATO ROT.
 —Heat in a moist atmosphere increased the destruction, and samples which had been cooled, and thereby partly protected, readily passed through all the changes when again exposed to warm and humid air. After using several substances by direct contact with diseased parts of potatoes, I soon found that the mixture of sulphurous acid, nitrogen, and common air, such as exists when sulphur is burnt in closed vessels, would prevent the further progress of the disease, in tubers already affected, and when exposed in contact with tubers passing through all stages of the disease, no further change in the prepared ones was induced. The trials were varied, and the uniformity of the results has led me to conclude, that the fumes of burning sulphur, flowing in contact with potatoes partly diseased, will arrest the further progress of the disease and prevent decay. It is proper that this conclusion should be received as an expression of fact, under the circumstances of experiments on a small scale, and with no more than two varieties of potatoes; but I confidently expect that the importance of the application will be seen in the largest exhibition of its effects. The practical use of the sulphurous acid gas is very simple, and not expensive.—Crude sulphur inflamed in a shallow cast-iron vessel, or an earthen pot, furnishes the fumes, which may be led by wooden pipes to the lower part of bins filled with the roots, until the occupied space is filled with them. As the fumes cool, they become heavier than air, and will then enter every interstice. By placing the pot of burning sulphur in an empty barrel, and inverting over it a barrel filled with potatoes, having a light rack in place of a head, the fumes will slowly rise within, and impregnate the mass; the barrel and contents being then removed, and the head replaced, the exposure may be considered as ample. Where the quantity is large, it would be more economical to leave a space vacant below the loose floor on which they repose, and introduce these fumes until part of the heap of potatoes has received a share. It should be remembered that this application will injure, if not destroy, the vegetating power of the tubers, and that although this result may be highly desirable for all that are preserved for food, those intended for seed should not be so treated.—*Dr Hayes, in Hovey's Magazine of Horticulture,*

GENERAL CAUTION RELATING TO BUYING HORSES.—Never purchase a horse from a friend; nor from a litigious man; nor a petty lawyer; nor from one who cannot pay the expenses of a law-suit. Never, before purchase, show that you are exceedingly well-pleased with the horse. Hear all that the seller and his grooms say about a horse; but be certain of nothing until you have ocular demonstration. Never appear

to know any of the tricks of dealers, unless they be attended with cruelty, when it may be proper to discourage and punish them by expressing disapprobation, and refusing to have any transactions with such men. But never be so rude as to betray any want of faith in the dealer. It is always very offensive, quite useless, impolite, and it may be erroneous. If you discover an unsoundness, or vice before purchase, it is needless to point it out. To say that the horse is too good for your purpose may serve as well. You need not offend the owner; and you have no right to give the horse a bad character, even when you are quite sure he deserves it. Seldom give the price first asked; twenty, thirty, or even forty per cent. is no great abatement in horse-dealing. Be cautious when a seller warrants a horse, and at the same time candidly tells you of some defect. A little tenderness produced by a bad shoe, may mean incurable lameness; a slight cough, of no consequence, may signify broken wind, or chronic cough; and when it is said that the horse is a little troublesome to go about, it may often be concluded that he is notoriously vicious. When an auctioneer says that the horse is not warranted, but that he will warrant him for a guinea, his offer may sometimes be taken, but upon condition that a fair trial be allowed before payment. Always, when possible, delay payment until the horse has been minutely examined and tried. Be suspicious when delivery is refused until the price is paid, or a certain portion of it deposited—that is, when you are known to be credit-worthy. When a horse has many faults, object only to that for which he can be returned. To object first to the price, then to windgalls, and last of all to spavin, is to say that right or wrong, you are determined to break the contract. To a person of doubtful character never, and to a dealer seldom, return a *paid* horse until the price is refunded. There are men who manage to keep both the horse and the money.—*Stewart's Advice to Purchasers of Horses.*

WATER BAROMETER.—A simple but effective barometer is in use at Liverpool by Captain Jones. The instrument is made of glass; in form it is like a balloon turned upside down, and a long upright spout, open at the mouth, affords the opportunity of filling it with water, and marks the state of the weather when in use. The elongated globe is filled with water till the fluid rises about an inch in the tube, and its action consists in a rise or fall of the water; the latter indicating wet and stormy, and the former fine weather. It is acted upon by the pressure of the atmosphere, requires no correction of any kind and is more sensitive and unerring than the column of mercury. The barometer is ornamental in appearance. It is much used in France, and its cost would not exceed 5s.

VEGETABLE GARDEN CLOCKS AND BAROMETERS.—We find the following curious observations published in the *Bell*, or *Weekly Intelligencer*, a literary gem of the last century. Fortunately at the present day clocks and watches are so plentiful that but very few persons would like to regulate their time by the flowers of the field. It is, however, interesting to notice the various influences and effects of the weather in relation to plants as well as animals and there can be no doubt whatever that much may be learned by studying their action:—"As there are but ten of the equinoctial plants which open at stated hours, the two first on the following list are taken from those which shut at a given hour:"—

	ENGLISH NAMES.	SCIENTIFIC NAMES.
Shut at 1	Proliferous pink	<i>Dianthus prolifer</i>
" 2	Marsh sow thistle	<i>Sonchus palustris</i>
Open at 3	Yellow goat's-beard	<i>Trogaopogon pratense</i>
" 4	Yellow devil's-bit	<i>Leontodon autumnale</i>
" 5	Common sow-thistle	<i>Sonchus oleraceus</i>
" 6	{ Spotted hawkweed	<i>Hypochaeris maculata</i>
" 6	{ Narrow-leaved ditto	<i>Hieracium umbellatum</i>
" 7	Broad-leaved ditto	<i>Hieracium sabaudum</i>
" 8	Narrow-leaved ditto	<i>Hieracium auricula</i>
" 9	{ Smooth-leaved ditto	<i>Hypochaeris glabra</i>
" 9	{ Carolina mallow	<i>Malva caroliniana</i>
" 10	Garden lettuce	<i>Lactuca sativa</i>
" 11	Alpine bastard hawkweed	<i>Crepis alpina</i>
" 12	Blue-flowered alpine	<i>Sonchus alpinus</i>

To this curious time-piece a couple of vegetable barometers may be added, which act upon similar principles, and are likewise sufficiently accurate for the gardener and farmer. The first barometer is the African marigold, or *Calendula pluvialis*. If the African marigold does not open its flowers in the morning about seven o'clock, you are sure to have rain that day, except it is to be accompanied by thunder. The second barometer is the Siberian sow-thistle, or *Sonchus sibiricus*. If the flowers of the Siberian thistle, keep open all night, you are sure of rain next day.—G. T.

A LARGE ONION GROWER.—The *Essex Herald* says—"That Mr. Circuit, a farmer at East Ham, has at the present time upwards of 600 people—men, boys, and women—employed in pulling, carting, and peeling onions for pickling, and they will be thus engaged for two months. He pays wages to the amount of £200 weekly, and the cost of each acre of onions averages £100. This includes preparing the ground, seeds, weeding, gathering, and peeling. Last year he sowed nearly a ton of onion seed. The onions are pulled by women, by the rod, and skinned by the galleons. At this season he makes about 1,500 different payments daily, as the people employed receive their money three or four times a day."

ANIMAL MANURE.—A vessel named the *Othello* arrived from Buenos Ayres, has brought a cargo of animal manure. This is a distinct description of manure from guano, and is officially designated by the term mentioned.

Few people know themselves, because they find the study of themselves an employment but little calculated to satisfy their pride or vanity.

The sweetest flowers are those which shed their odours in quiet nooks and dingles; and the purest hearts are those whose deeds of love are done in solitude and secret.

FRUIT TREES, FLOWERING SHRUBS AND BULBOUS ROOTS, AT AUCTION.

THE Annual Fall Sale of FRUIT TREES, &c., on account of James Dougall, Esq., ROSE-BANK NURSERY, will take place on Thursday, 24th October instant, at the office of the undersigned, comprising in part, the following assortment: say about—

4000 APPLE TREES—Summer, Fall and Winter, choice named sorts; among which will be about 300 each, *Pommes Grises* and *Fameuses*, in lots to suit purchasers

200 PEAR TREES, on Pear and Quince Stocks.

100 CHERRY TREES—choice sorts.

250 GOOSEBERRY BUSHES—Lancashire kinds.

1500 RASPBERRY Do—Fastolf, Franconia, and true white and red Antwerps.

An assortment of Flowering shrubs, comprising fine named Roses, Lilies, Honeysuckles, Tree Peonies in variety, &c.

Also 2000 fine, named Tulip Roots—a very complete assortment; together with named Hyacinths, Lilies, Narcissus and other Bulbous Roots.

This Sale will be like all the previous Sales, without reserve, and the assortment deserves the attention of parties intending to plant Fruit Trees, or to cultivate fine flowers, whether at Montreal or at a distance.

Catalogues, with directions for planting and cultivating the various kinds of Trees, Flowers, &c., will be prepared previous to the sale.

The Trees sold at last Fall Sale, stood the Winter, quite well and so far as is known, grew vigorously this season.

Parties attending the Provincial Show, and not having time to wait for the sale, may be supplied by applying to JOHN DOUGALL, MONTREAL WITNESS OFFICE, AGENT FOR THE NURSERY.

Sale at 10 o'clock, forenoon.

JOHN LEEMING,
Auctioneer.

PREPARING FOR PUBLICATION.

NOTES ON NORTH AMERICA, AGRICULTURAL, SOCIAL, AND ECONOMICAL, by James F. W. Johnston, F.R.S.S.L. and E., &c., author of "Lectures on Agricultural Chemistry and Geology," &c., &c., in two vols. post octavo. William Blackwood & Sons, Edinburgh and London.

THOROUGHbred LEICESTER RAMS.

THE Subscriber has a few of the above stock for sale.

A. DUFF.

Lachine, Oct. 1st. 1850.

NOTICE.

THE WASHINGTON COUNTY MUTUAL INSURANCE COMPANY.

THE Under-signed, AGENT of this Company for the district of MONTREAL, begs to state, that he is now prepared to make surveys, effect insurance, and attend to all instructions left for him, at his Father's Residence, Côte St. Paul, or at the Residence of his Brother, River St. Pierre, and at the Post Office Montreal.

WILLIAM EVANS, Jun.

Côte St. Paul, 9th August, 1850.

MATTHEW MOODY,

MANUFACTURER OF

THRASHING MACHINES, REAPING MACHINES, STUMP AND STONE EXTRACTORS, ROOT CUTTERS, REVOLVING AND CAST-STEEL HORSE RAKES, PATENT CHURNS, WAGGONS, &c. &c. &c.

THE Subscriber has been employed since 1846 in manufacturing his improved THRASHING MACHINES, with Horse powers. He was awarded the highest Prize at the Terrebonne County exhibition after competition with many others. They have thrashed and cleaned, with 2 horses, from 100 to 124 minots of Wheat per day, and from 200 to 250 of Oats, and have given universal satisfaction. He guarantees all purchasers for any recourse by Paige & Co., of Montreal, who allege having a patent for these machines, dated December, 1848! and warrants them equal to any made here or elsewhere, for efficiency and durability.

One of his Reaping Machines may be seen at Kerr's Hotel, St. Lawrence Street, price £25.

Having lately erected new and enlarged Works for the above articles, he will execute promptly all orders in his line.

Thrashing Mills constantly on hand. Two second hand Mills, in warranted order, cheap for cash.

Thrashing Mills repaired, and finishing work done.

Agency in Montreal, at Ladd's Foundry, Griffintown; in St. Andrews, L. C., at Mr. Henry Kempley's.

TERREBONNE, August, 1850.

GREAT AGRICULTURAL WORK!

THE FARMER'S GUIDE.

TO

Scientific and Practical Agriculture.

BY HENRY STEMIENS, F. R. S. E.,

Author of the "Book of the Farm," Editor of the "Quarterly Journal of Agriculture," &c. &c.,

ASSISTED BY JOHN P. NORTON, A. M.,

Professor of Scientific Agriculture in Yale College, New Haven, Author of Agricultural Prize Essays &c. &c.

THIS highly valuable work will comprise two large royal octavo volumes, containing over 1400 pages with 18 or 20 splendid steel engravings and more than 600 engravings on wood, in the highest style of the art, illustrating almost every implement of husbandry now in use by the best farmers, the best

methods of ploughing, planting, haying, harvesting, &c. &c., the various domestic animals in their highest perfection; in short, the pictorial feature of the book is unique, and will render it of incalculable value to the student of agriculture.

This great work is the joint production of two of the most talented agricultural scholars of the day; the one eminent as an author and editor in Great Britain, and the other as a Professor in Yale College. Both are eminently practical as well as scientific men, and all they say may be relied on as the result of profound research, tested and sustained by practical experiment. The contributions of Professor Norton are chiefly designed to adapt the British portion of the book to this country, and thus to make it an Anglo-American work, giving to its readers all the really useful agricultural knowledge at present attainable in either country.

The work is divided into four departments, distinguished by the four seasons of the year, commencing with Winter, and Prof. Norton's notes, will be published as an appendix to each part. The first chapter treats of the following subjects, under the head of

INITIATION.

On the best of the existing Methods for acquiring a thorough knowledge of Practical Husbandry. On the Difficulties to be encountered in learning Practical Husbandry, and on the Means of overcoming them.

On the Different kinds of Farming.

On the persons required to Conduct and Execute the Labor of the Farm.

On the Branches of Science most applicable to Agriculture.

On the Institutions of Education best suited to Agricultural Science.

On the Evils attending the neglect of Landowners and others to learn practical Agriculture.

On observing the details and recording the facts of Farming by the Agricultural Student.

Terms of the Work.—The American edition, the first number of which is already issued, will be published in semimonthly numbers of 64 pages, with an English steel engraving in each number, of which there will be about 22 in all. PRICE, 25 CENTS PER NUMBER, OR \$5 IN ADVANCE FOR THE 22 NUMBERS.

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The work can be sent in Numbers at periodical rates of postage, and mail remittances may be made at the risk of the Publishers.

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THE Proprietors of this establishment are prepared to Manufacture LOOKING GLASS PLATE and WINDOW GLASS, of every size, coloured and fancy, according to patterns or orders. Shades for Oil and Gas Lamps, plain, tinted, or coloured, in the richest hues—Coloured Glass of any pattern for Churches, similar to those of European Churches; also, for Cottages, Gardens, Houses, and Steamers—Bottles and Vials for Druggists made to order.

—ALSO,—

SODA, GINGER, and ROOT BEER BOTTLES, with or without the maker's name.

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All these articles shall be of the very best quality and disposed of on reasonable terms; and the proprietors solicit a share of public patronage, and the examination of their Manufactures.

For orders or further particulars enquire of the proprietor, at the People's Hotel, No. 203 and 207, Notre Dame Street, Montreal.

Vaudreuil, January, 1850.

FARMING IMPLEMENTS.

WE, the undersigned, certify that we have carefully inspected a variety of Farming Implements manufactured by Mr. A. Fleck of St. Peter Street and we feel great pleasure in recording our unqualified opinion that they are very much superior to any article of the kind which we have seen manufactured in the country, and equal to any imported.

And we would particularly recommend to the notice of Agriculturists throughout the Province his Subsoil Grubber, which he has improved upon from one which took a premium of £10 from the Highland Society of Scotland. This implement seems well adapted to improve and facilitate the labours of the Farmer, and we cannot doubt that it will soon be extensively used in improved cultivation. His Scotch and Drill Ploughs are also very superior, and well worthy of the inspection of every one desirous of possessing a valuable article.

M. J. HAYS, Côte St. Antoine,
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THE Subscriber has on hand three REAPING MACHINES of the latest and most improved construction, capable of cutting twenty-two acres per day. Being manufactured by himself, he is prepared to warrant both material and workmanship as of the best order. Price moderate.

MATHEW MOODY, *Manufacturer.*

NEW SEED STORE.

THE Subscriber begs to acquaint his Friends and Customers that he has, under the patronage of the Lower Canada Agricultural Society,

OPENED HIS SEED STORE,

At No. 25, Notre Dame Street, Opposite the City Hall Where he will keep an extensive assortment of AGRICULTURAL and GARDEN SEEDS and PLANTS of the best quality, which he will dispose of on as favourable terms as any person in the Trade. From his obtaining a large portion of his Seeds from Lawson & Sons, of Edinburgh, who are Seedsmen to the Highland and Agricultural Society of Scotland, he expects to be able to give general satisfaction to his Patrons and Customers. He has also made arrangements for the exhibition of samples of Grain, &c., for Members of the Society, on much the same principle as the Corn Exchanges in the British Isles. He has a large variety of Cabbage Plants, raised from French seed, which he will dispose of to Members of the Society, at one fourth less than to other customers.

GEORGE SHEPHERD.

Montreal, April, 1849.

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AGRICULTURAL JOURNAL, AND TRANSACTIONS

OF THE

Lower Canada Agricultural Society.

VOL. 9.

MONTREAL, NOVEMBER, 1859.

NO. 11.

How very desirable it would be that the rural population of Lower Canada should bestir themselves, and endeavour to realize the numerous advantages which their situation and circumstances have placed at their disposal. We have frequently attempted to enumerate these advantages, and the more we see of this and other countries, we become more firmly persuaded that we have never over estimated Lower Canada as compared with other countries. The rural population with us, we believe, are not so generally educated, as the farming classes of neighbouring countries, but this defect is in our own power to remedy. In introducing any changes of our systems of education for the rural population, it is to be hoped that due provision will be made to give this education an agricultural character that will be suitable for, and useful to the youth to whom it is imparted. Above all other considerations this is necessary, if we desire to attach the educated sons of farmers to the profession of their fathers. If this is not attended to, the children of farmers that obtain education according to the present system of schools, are very likely to fancy any profession rather than that of an agriculturist. Agriculture has never been done justice to in Canada by the systems of education that are got up for the children of agriculturists. Nothing can be more calculated to estrange the mind of a youth from the pursuit of agriculture than the teaching he receives at school. His reading and teaching, from beginning to end, is of every subject but agricul-

ture, although his parents, perhaps, intended him for a farmer. He naturally concludes that farming cannot be a suitable employment for a man of education, or it would require some education to fit him for such an occupation, he is, therefore, disposed on leaving school to despise the occupation of his father, and to apply himself to some other business. Farmers perceiving this propensity in their children, are not so anxious to have them properly educated and we condemn farmers for their disinclination, we humbly conceive, very unjustly. We object not to a good education for the children of the rural population, on the contrary, let it be as good as possible, but let the science and art of agriculture be a part of the education. If youth will, after such instruction, go to other professions, and prefer them, there can be no sound objection offered, however such a choice may be regretted. The sons of farmers would thus have a fair chance of practising their profession with advantage and being duly educated for it would not have any disinclination to it, or disrespect for it. It is time we should come to some just conclusion on this matter, and provide for the agricultural classes, the same advantages of instruction in their profession, that are provided for other classes in their several professions.

Large minds, like large pictures, are seen best at a distance. This is the reason, to say nothing of envious motives, why we generally undervalue our contemporaries, and over-rate the ancients.

We in a former number stated, that we were not disposed to admit but that Lower-Canada could show examples of good husbandry, equal to any on this continent, and that we were in a condition to lead in the art of good husbandry, and the manufacture of good implements, instead of following any other country in North America. We are more confirmed in this opinion every day and although we write this article before the Industrial Exhibition takes place at Montreal, we feel confident that the result of that exhibition will fully sustain our pretensions. We shall be much disappointed indeed, if we do not show products of Agriculture, Horticulture, and implements of husbandry equal to any that have been exhibited, and we hope, that will surpass all other. Our ploughing match also, we have not the slightest doubt, will show work executed by our implements that cannot be excelled. It is in this way we expect to prove that our pretensions are not idle words, and that we are in reality entitled to lead instead of following in the art, and practice of agriculture and in the manufacture of agricultural implements. The necessary implements of agriculture are not so numerous, and we should greatly prefer, a few, well selected and suitable implements, that would be necessary to carry on our business properly, to a large number that were not of the best quality, and which might not be required for use. It is only a waste of capital to be collecting every implement that may be offered for sale whether necessary or not. It is certainly well to have all necessary implements, but it is absurd to purchase every thing offered and recommended unless a farmer wishes to open a hardware store, or one of agricultural implements. Well made implements of good materials, light, and at the same time of sufficient strength to execute the work they are intended for, are the grand requisites, and we have seen very many implements exhibited, very deficient in these qualities, and only fit for the show room. Farmers should be cautious in purchasing im-

plements until they have been proved at work in the field by parties who can be depended upon. We hope the Industrial Exhibition will show farmers where they can best supply themselves with agricultural implements.

To the Editor of the Agricultural Journal.

ST. FOY, COUNTY OF QUEBEC,

15th October, 1850.

SIR,—I take the liberty of enquiring, through the columns of your valuable Journal.—Whether it be proper and necessary, at Ploughing Matches, that the depth and width of the Furrow Slice should be given?—And, likewise, the time for finishing the work?

By answering the above in your forthcoming number, you will greatly oblige

Your obedient servant,

A YOUNG PLOUGHMAN.

In reply to a "Young Ploughman," we never witnessed a Ploughing Match in the old country that there was not a scale given to plough by, so that the furrow slice should be of the due proportion in depth and width. The usual scale was 5 inches in depth by 8 inches wide, or 6 inches in depth, by 9 or 9½ inches in width, and if the proportion was not kept, the ploughman was disqualified. We have seen the same scale given at Montreal. Some parties may imagine that establishing a certain scale is not necessary. We think otherwise. Land ploughed by the above scales will be *better* ploughed than by any other scale and give a better seed-bed for the crop. In the smaller scale, if properly executed, each furrow slice covers the one turned before it 3 inches, thus leaving an angle of the furrow slice for the harrow, of 5 inches each way, to cover the seed. In the larger scale, an angle of 6 inches each way is left. There cannot be any better mode of executing ordinary ploughing than this. When due proportions are not observed, the ploughed soil will lie too flat, and cannot be harrowed properly to cover the seed. In summer fallowing, or for green crops, it is not so necessary to adopt any particular scale, so that all the land is turned, but in all cases, if a minute division of the soil is desired, the smaller the furrow slice the better. There was, and should be, a time given to complete the work,

and any ploughman who did not finish within the time was disqualified. The usual time allowed to plough half an acre was three to four hours according as the soil was easy or difficult to plough.

St. Foy, COUNTY OF QUEBEC,
14th October, 1850.

SIR,—I take the liberty to forward you a small quantity of a peculiar quality of oats, which I find to answer this climate extremely well, and to be profitable as to the quality and quantity of meal it yields; its flavour is peculiarly agreeable, —I got a small quantity of these oats last year, which I sowed the 20th May last, in light soil which, the previous year, had been under potatoes, and reaped them on the 20th August. The straw was of good length, and not too rank, and therefore not subject to lodge.

I hope the sample I send you, when tried, will induce farmers in the Province to prefer it to other oats, as more profitable, yielding as good, and a more certain crop

I have the honor to be,

Your most obedient humble servant,

MATHEW DAVIDSON.

Wm. Evans, Esq.,

Montreal.

It appears from the following extract, from the Bankers' Circular of September 20th, that the wheat crop in England is far from being a very heavy crop. We have also seen Reports from several English counties, and from Ireland, that state the damage to the wheat crop, by the wheat-fly and other causes, is very extensive indeed, it is said that the crop has not been more deficient for twenty years past in England. We have no particular Reports of the state of the wheat crop in Scotland, but it appears that in the latter country, the season has been very dry this year, and that was favourable to wheat:—

“There has not been in England a season for twenty years, in which the diseases in the wheat crop were so various so extensive, or so general. The mildew, the smut, the red-gum, and the mildew, have appeared more or less in moist counties of England. The two first may be passed over as being of partial range, and comparative-

ly unimportant in effect. The red gum, or, as it is termed in some counties, the red robin, may be found in all seasons, but in no former year for a long period of years has it ever been so general or so destructive as in the year 1850. Many farmers will tell you that it has destroyed one-half of their wheat crop. Such extreme cases, however must be rare. There can be no doubt of the extent and of the destructive nature of the disease upon the wheat crop of 1850; I have discovered it in all the midland, western, and eastern counties of England; also in Durham and Northumberland. As far as my observation enables me to determine, it was most rife in Berkshire, Wiltshire, Oxfordshire, and Gloucestershire, and the counties lying between them and the coast counties of the eastern shore. Careless persons are apt to treat the red gum with indifference because it prevails more or less every season; but they will find that in this year it spread to an extent that will make a serious inroad on our annual supply of wheat of domestic growth. I believe it has struck out a quantity greater than that which has been lost by mildew, because it spread much more extensively, and affected nearly all districts—some to a lamentable degree.

“The mildew prevailed in Northamptonshire, Rutlandshire, Leicestershire, Derbyshire, and Nottinghamshire, partially; in the low lands of Cambridge, Lincoln, and East Yorkshire, very extensively. On two lines of railroad through Lincolnshire you could scarcely find a single field of full-cropped wheat without mildew; some of those crops were almost wholly destroyed by this destructive disease. All the way from New Holland, through Grimsby and Boston, to near Peterborough, it was quite melancholy to look over large fields of wheat beaten down flat, of a dark dingy green colour, showing that the corn would never ripen, and would never assume any other hue. The same from Retford, through Lincoln, to near Peterborough. When you reached within about five miles of that city, the wheat crops presented a healthy harvest colour, and one could observe very little of this disease all the way from that point to London; some in Huntingdonshire, while Bedfordshire and Hertfordshire were comparatively free from it. The mildew also prevailed extensively throughout the low marsh lands of the East Riding of Yorkshire; neither were the wolds entirely free from it. The *Times* newspaper still talks about an average crop of wheat; but in its report of the corn trade in Mark-lane on Tuesday last, there is this significant passage: ‘The samples on sale from Cambridgeshire and Lincolnshire for delivery by railway, presented a striking contrast to the Essex and Kent, as—although a few were fine and bold—the principal part were shrivelled and light.’ To be sure they were, as the writer might have known they must be, if

he had examined those counties a month ago. The worst samples from the midland districts will never be sent to the London market for sale.

"These are, consequently, the main facts of the case, so far as the wheat crop of England is concerned: 1. General deficiency arising from blight, and the inability of the injured plant to feed a numerous family of grains. More widespread disease of a great variety than has been known in England for more than twenty years.

WOOL.

The wool of the different races, families, and breeds of domesticated sheep differs so widely in comparative length of staple as to have occasioned them to be classified into short-woolled, middle-woolled, and long-woolled—and differs also so widely in comparative softness and tenacity as to have caused them to be classified into coarse-woolled, medium-woolled, and fine-woolled. But the wool of any one breed differs both in length and in fineness, as well as in other properties, according to the circumstances of climate and pasture and treatment in which the breed is reared and maintained; and the wool of each individual of every breed, in all circumstance, has somewhat widely different properties in different parts of the body. The wool of the most steady climate, the most congenial pastures and the most judicious management, is always bulkier and finer than that of inclement districts, irregular feeding, and bad store husbandry; the wool of light arenaceous or calcareous sheep-walks has always a cleaner texture and a purer colour than that of such soils as those of some parts of Gloucestershire, which impart to it an orange tinge, or that of such soil as those of some parts of Hertfordshire and Warwickshire, which give it a brownish hue, or that of such districts as the fens of Lincolnshire and Cambridgeshire, which give it a dark blue tint; and the wool of the shoulders, back, and sides, of any individual sheep, is finer than that of the upper part of the thighs, the upper part of the legs, and the parts extending thence toward nearly the haunch and the tail—and the wool of these parts, again, is finer than that of the upper part of the neck, the throat, the breast, the belly, and the lower part of the legs. The separating and assorting of the different qualities whether from one fleece or from a collection of fleeces, is a nice process of art, and is performed sometimes under the direction of the manufacturers who have purchased and are about to use the wool, but more commonly by a class of persons called the wool-staplers, who have qualified for their employment by a regular apprenticeship, and who purchase the raw material from the grower, and sell it in an assorted state to the manufacturer. The operator unrolls the fleece on the table, spreads it out under a clear

light, and, under the joint guidance of his sight and his touch, culls out successive locks of uniform fineness of filament, and deposits them in a basket; and he assort the whole into six or ten or, in some cases, a greater number of kinds, and has beside him a separate basket for each kind, and goes through the whole process with a promptitude, accuracy, and celerity, which quite astonish the uninitiated. "In sorting wools," says M'Culloch, "there are frequently eight or ten different species, in a single fleece; and if the best wool of one fleece be not equal to the finest sort, it is thrown to a second, third, or fourth, or to a still lower sort, of an equal degree of fineness with it. The best English short native fleeces, such as the fine Norfolk and Southdown, are generally divided by the wool-sorter into the following sorts, all varying in fineness from each other, viz., first, prime; second, choice; third, super; fourth, head; fifth, downrights; sixth, seconds; seventh, fine abb; eighth, course abb; ninth, livery; and tenth, short-course or brack wool." But either these divisions, or any others to a lesser or greater amount, would be far better designated by simple numerical names; and all vary in their relative market value, according to the demand for respectively coarse, middle, and fine cloths. The long wools, in an aggregate view, have a staple of seven inches and upwards—the middle wools, of from four to seven inches—and the short wools, of from two to four inches.

The comparative properties of wool are very vaguely expressed by the epithets coarse and fine or by any other two or three general words; and they have been somewhat better designated as follows, by Arthur Young, in the order in which they are esteemed and preferred by the manufacturer:—"First, fineness with close ground, that is, thick-matted ground; second, fineness; third, straight-haired, when broken by drawing; fourth, elasticity, rising after compression in the hand; fifth, staple, not too long; sixth, colour; seventh, what course is in it to be very coarse; eighth, tenacity; ninth, not much pitch mark, but this is no other disadvantage than the loss of weight in scouring. The bad or disagreeable properties are—thin, grounded, topky, curly-haired, and, if in a sorted state, little that is very fine, a tender staple, no elasticity, many dead-white hairs, very yolky. These who buy wool for combing and other light goods that do not want milling, wish to find length of staple, fineness of hair, many pitch-marks." Another clearer, and shorter classification of properties may be made into soundness, length, cleanness, colour, softness and feltability. Soundness arises from the healthy condition and proper feeding of the animal, and comprises uniformly, flexibility, and kindness of the pile, but perfectly comports with the wide diversity of the other properties correspondent to the different families

and breeds of sheep. Length or shortness or any medium between the two must be variously suitable according to the different purposes of the manufacturer, but ought always to be uniform in the same specimen, or at least as nearly so as will comport with a due regard to the assortment of the other properties. Cleanmess, though mainly desirable for preventing expense and the loss in the process of scouring, is desirable also for its appreciable conservation of soundness and softness; and it requires that no dirty or discolouring ingredient be employed in salving, that as little as possible of any ochreous substance should ever get into the shepherd's or store-master's possession, and that the living flock, as well as the separated fleece, should be kept aloof from whatever might pollute them. Colour is important because wool excels cotton and linen and even silk in taking on bright and beautiful hues in the process of dyeing—and because white wool receives the colouring matter more readily than black, and clear white wool more readily than creamy-coloured or brownish or dingy—and because any mixture of black filaments with the white, mars the harmony of the dye, and renders the whole specimen unsuitable for the reception of the brighter and more delicate hues. Softness has been raised to paramount importance by the demands of fashion; and depends partly on the minuteness of the fibres, partly on the combination of soundness and feltability, and partly on the abundance and tenuity of the lubricating yolk; and it more or less comprises or includes the two properties which Arthur Young and many other popular nomenclators call fineness and elasticity. What we have designed feltability is the most curious of all the properties; and is identical to a certain extent with what is popularly called fineness, but still more with a peculiar and very beautiful structure of the filaments quite recently discovered; and may be well understood from the following account of it by Mr. Spooner:—"The felting property and other qualities of different wools have long been known by practical experience; but we are indebted to Mr. Youatt for the discovery, that the felting property depended in a great measure on the number of serrations on its surface. This gentleman, after several laborious attempts, at length succeeded, with the assistance of a powerful achromatic microscope and its scientific maker, in developing the singular structure of wool and the different qualities. Each fibre was found to consist of a number of leaves attached to a central stem or band, and extending in one direction, viz., from the root to the point. This was the result of examining a filament on an opaque object; but when viewed as a transparent object, the edges of the leaves were more visibly apparent, appearing like so many teeth pointing in one direction, and thence properly termed the serrated

edge. The fibre of wool thus magnified appears somewhat like a common fir-tree. On examining different wools, Mr. Youatt found that the number of serrations corresponded to the felting qualities of the wool, being in the Saxon no less than 2,720 in the inch, in the Southdown 2,080, and in Leicester 1,860 alone. Thus fine wool differs from coarse in having a greater number of serrations and growing in a more spiral form, which, of course, increases the number of curves; but to this we must add the fact of its being actually finer or smaller in its fibres; so that while a fibre of the coarsest wool is 1-450th, the finest is 1-1500th of an inch in diameter. It can easily be conceived how the curious structure of the wool, particularly its serrated edge, must conduce to its felting property. As long as the filaments are kept in the same direction, these serrations are comparatively inoperative; but torn to pieces by the card and mixed in every direction, the serrated edges must tend to hook and entwine together; and this must be pretty much in proportion to the number of serrations in a given space, particularly when this is added to the fact that the wool is more curved as the serrations are numerous."—*Rural Cyclopædia*.

A DAIRY STOCK.

I recommend the following mode of managing a milk stock, the principles of which are followed by the best milk-selling farmers. Curry and wisp the cattle once a day, give water twice a day when in the stall, and an hour's airing in the yard. Let the food be given to them at exactly the same hour every day, and likewise the water. When food is given, and any cow does not take to it readily, take it from her, and let her be without any until next feeding time (this is the way man should do to remain in health.) Never pamper immediately after calving. At milking time the master or mistress should assist, or be present, in order to see that the milkers milk briskly, and without talking. A great deal depends on these two points. A milker may sing or whistle, but not talk, but then it must be tuneable. There is an old saying, that the last drop is the richest, and should be drawn. This is wrong, for the last drop from a good milker never does come. I have seen milkers pulling at the udder for the "last drop," while a weakly constituted cow has been nearly sick. A mother who has suckled children can understand this, and yet I have known thoughtless mothers to forget it when milking cows. In stripping a cow, a milker finishes with his right hand, by taking the teats in rotation, and getting what he can out; and when he gets hold of a teat, if he can get milk twice, he must try that teat again after he has gone them round; but if he can only get milk

once, he should give up, for the last drop which ought to be taken is then come : and if more after this is got, it is a pull upon the milk vein and is no richer than milk taken at the first, or rather, it is of an average quality. If a milk farmer intends to follow his business to the best advantage, either he or his wife must themselves milk, or be present during the time of milking. One of the best managers I am acquainted with, always did the stripping himself, and left the others to do the regular milking.

The proper temperature for a dairy, where butter is made, will be from 50 to 60 degrees, according to the temperature of the weather. There should be plenty of air circulating through it. If it be too warm where the cream stands, it will lift in the cream mug, and the butter will be rancid ; and if it be too cold, the cream will not get sufficiently acid for churning in proper time ; in this case the butter will have what we call a bingey taste. Bad dairymen, to insure good butter, will churn the cream before it is acid, but this is a waste of labour, inasmuch as the cream, in this case, must be churned until it is acid, before the butter will separate from the milk. When churning commences the cream should be at from 62 to 68 degrees, according to the temperature of the weather, or of the room. No water should ever be used about butter in making up, as water left in butter is just as bad as milk, and it will soon make the butter bad. Nothing but labour, by working the butter, will produce real solid sweet butter, and make it keep sweet. The following is a statement for eight years, previous to 1810, of the stock, produce, &c., of a dairy farm in the neighbourhood of Rochdale :—The farm is on the mixed system of dairying, that is, part of the milk is sold in the new, part skimmed, the cream being churned, and the skim milk and butter-milk sold as well as the butter.

Year.	No of Cows kept		Quantity of Butter produced		Quantity of New Milk sold.		Value of Butter sold.		Value of Milk sold.		Total value of Produce.		Average produce of each Cow.	
	lbs.	qts.	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.
1833	28 6608	5334	359	16 2	345	8 5	705	4	725	3 8				
1834	28 6695	6890	364	10 5	347	13 9	712	4	725	8 8				
1835	27 6733	7735	366	11 7	328	5 11	694	17	625	14 7½				
1836	25 6112	9350	357	15 8	353	2 0	710	17	828	8 8½				
1837	25 6010	11390	376	5 0	331	19 10	711	4	1028	8 11				
1838	24 5929	9391	347	2 2	340	4 10	687	7	928	11 1½				
1839	25 5618	4743	328	19 4	313	13 1	642	12	525	14 1½				
1840	23 5530	2444	346	0 0	317	5 11	717	10	1131	3 11½				

In addition to the above there were about 150 lbs. of butter, and 1,000 quarts of milk annually consumed in the house ; value about £15. The cows were kept on pasture in the summer, with about one quarter bushel of grains each daily ;

in the winter on hay, potatoes, turnips, and grains, with bean flour or oatmeal. On an average 11 cows were changed (bought and sold) every year, at about £6 loss for each cow changed. The farm was an entire grass farm, consequently all the provender had to be purchased, and cost, on an average, £150 per year, —*Ruthwell's Agriculture of Lancashire.*

[The report on the agriculture of Lancashire, from which the above extract is taken, was intended for competition for the prize offered by the Royal Agricultural Society of England, but, arriving too late, could not be received. It contains much of sensible remark, and will well repay perusal.—ED]

STEAM MACHINE FOR MAKING BREAD.—On Tuesday last we attended an exhibition of the process of making bread and biscuits by steam, a patent being taken out for apparatus by Messrs. Lee and Robinson, of Wapping. The two important points in this process which struck our attention were, first, the preparing the dough almost immediately, without being set in sponge five or six hours, as is the common practice at present ; and secondly, the appropriating the waste steam to the purposes of baking—that being the power which converts the dough into bread in the oven. The following is as concise a description as we can give of this most surprising invention. The flour falls into a hopper in an even and regular manner, at the same time a regular supply of carbonated or soda-water is likewise supplied ; these, intermingling in even proportions, are conducted to a tub, where machinery like that in a pug-mill mixes, and, at the same time macerates the mixture, until it is converted into dough : then it is expelled through a square opening, where, by a simple contrivance, as it protrudes, it is cut by a sliding door into any weight, from that of a quarter loaf to a biscuit. As each piece of dough is cut, it falls into a cloth attached to endless chain, whereby the operation of “moulding” is performed : a small boy then places the loaves on a baking-table furnished with wheels, the whole batch being thereby set in or withdrawn from the oven at the same moment. The same free current of steam which keeps the machinery in motion is the power which heats the oven : it passes openly and directly upon the bread, thus avoiding the dangerous pressure where heating by steam in strong pipes is used. That steam is the power used in baking is shown by the patentee, who opened the door of the oven, introduced an iron shovel, and withdrew it with the steam condensed on it into water ; while at the same time the bread in the oven was collecting a strong brown crust from the same agency. The machinery is very simple, and can be easily attached to any steam-mill ; and, by having the flour directly conveyed into the hop-

per of this invention, to be mixed as above described, the same steam power which now produces flour can, with the same ease and facility, produce in the same establishment, bread. On the score of economy, as well as that of cleanliness, the above process deserves every encouragement. The apparatus is in daily use at 278, Wapping, and the inspection of it will well repay a visit.

DRAINING.

The following remarks on Draining are from the *Penny Cyclopædia*, and by the Editor:—

As a certain quantity of moisture is essential to vegetation, so is an excess of it highly detrimental. In the removal of this excess consists the art of draining. Water may render land unproductive by covering it entirely or partially, forming lakes or bogs; or there may be an excess of moisture diffused through the soil and stagnating in it, by which the fibres of the roots of all plants which are not aquatic, are injured, if not destroyed.

From these different causes of infertility arise three different branches of the art of draining, which require to be separately noticed.

1. To drain land which is flooded, or rendered marshy by water coming over it from a higher level, and having no adequate outlet below.

2. To drain land where springs rise to the surface, and where there are no natural channels for the water to run off.

3. To drain land which is wet from its impervious nature, and where the evaporation is not sufficient to carry off all the water supplied by snow or rain.

The first branch includes all those extensive operations where large tracts of land are reclaimed by means of embankments, canals, sluices, and mills to raise the water; or where deep cuts or tunnels are made through hills which formed a natural dam or barrier to the water. Such works are generally undertaken by associations under the sanction of the Government, or by the Government itself; few individuals being possessed of sufficient capital, or having the power to oblige all those, whose interests are affected by the draining of the land, to give their consent and afford assistance. In Britain there is no difficulty in obtaining the sanction of the Legislature to any undertaking which appears likely to be of public benefit. In every session of Parliament acts are passed, giving certain powers and privileges to companies and individuals, in order to enable them to put into execution extensive plans of draining. That extensive draining in the counties of Northampton, Huntingdon, Cambridge, Lincoln, Norfolk, and Suffolk, which is known by the name of the **BEDFORD LEVEL**, was confided to the management of a chartered corporation, with considerable powers, as early

as the middle of the seventeenth century; and by this means an immense extent of land has been rendered highly productive, which before was nothing but one continued marsh or fen.

In the valleys of the Jura, in the canton of Neuchâtel in Switzerland, which are noted for their industry and prosperity, extensive lakes and marshes have been completely laid dry, by making a tunnel through the solid rock, and forming an outlet for the waters. The greater part of the Netherlands, and Holland, have been reclaimed from the sea, and from rivers which flowed over them; and they are now as productive lands as any on earth.

In Canada, draining is very difficult; and in consequence some of the best situated lands are allowed to remain waste, that would not require a large expenditure to drain them perfectly. The principal obstacle is, the want of power to oblige all those whose interests would be affected by the draining of the land, to give their consent, and afford assistance. In some particular cases, were a proper application to be made now to the Government, perhaps the necessary powers might be obtained. It is only where outlets require to be cut, that would drain large tracts of land; or where small rivers require to be straightened and deepened, that the interference of the Government could be applied for. But in such cases, were the Government to grant the necessary powers, it would greatly promote improvement, and prove highly advantageous to the industrious agriculturists.

In hilly countries it sometimes happens that the waters, which run down the slopes of the hills, collect in the bottoms where the soil is impervious. In that case it may sometimes be laid dry by cutting a sufficient channel all round, to intercept the waters as they flow down, and to carry them over or through the lowest part of the surrounding barrier. If there are no very abundant springs in the bottom, a few ditches and ponds will suffice to dry the soil by evaporation from the surface. This principle might be applied with great advantage, in many cases, where the water could not be drained out of considerable hollows, if it were allowed to run into them.

When there are different levels at which the water is pent up, the draining should always be begun at the highest; because it may happen that when this is laid dry, the lower may not have a great excess of water.

In draining a great extent of land, it is often necessary to widen, straighten, and deepen rivers, and alter their course; and not unfrequently the water cannot be let off without being carried, by means of tunnels, under the bed of some river or canal, the level of which is above that of the land. In more confined operations, cast-iron pipes are often a cheap and easy means of effecting this. They may be bent in

a curve, so as not to impede the course of the river, or the navigation of a canal.

The draining of land, which is rendered wet by springs arising from under the soil, is a branch of more general application. The principles on which the operations are carried on, apply as well to a small field as to the greatest extent of land. The object is to find the readiest channels by which the superfluous water may be carried off; and for this purpose an accurate knowledge of the strata through which the springs run is indispensable. It would be useless labour merely to let the water run into drains after it had sprung through the soil and appears at the surface, as ignorant men frequently attempt to do, and thus carry it off after it has already soaked the soil. But the origin of the spring must, if possible, be detected; and one single drain or ditch, judiciously disposed, may lay a great extent of land dry if it cut off the springs before they run into the soil. Abundant springs, which flow continually, generally proceed from the out-breaking of some porous stratum in which the waters were confined, or through natural crevices in rocks, or impervious earth. A knowledge of the geology of the country will greatly assist in tracing this, and the springs may be cut off with greater certainty. But it is not these main springs which give the greatest trouble to an experienced drainer; it is the various land springs, which are sometimes the branches of the former, and often original and independent springs, arising from sudden variation in the soil and subsoil.

In England, it is found that in one situation boring will bring water, and in another it will take it off. This principle being well understood will greatly facilitate all draining of springs. Wherever water springs there must be a pervious and impervious stratum to cause it, and the water either runs over the impervious surface, or rises through the crevices in it. When the line of the springs is found, the obvious remedy is to cut a channel with a sufficient declivity to take off the water in a direction across this line, and sink through the porous soil at the surface into the lower impervious earth. The place for this channel is where the porous soil is the shallowest above the breaking out, so as to require the least depth of drain; but the solid stratum must be reached, or the draining will be imperfect. It was by attending to all these circumstances that Elkington acquired his celebrity in draining, and that he has been considered as the father of the system. It is, however, of much earlier invention, and is too obvious not to have struck any one who seriously considered the subject. In the practical application of the principle, great ingenuity and skill may be displayed, and the desired effect may be produced more or less completely.

When the drains cannot be carried to a sufficient depth to take the water out of the porous

stratum saturated with it, it is often useful to bore numerous holes with an auger in the bottom of the drain through the stiffer soil, and, according to the principle explained, the water will either rise through these bores into the drains and be carried off, and the natural springs will be dried up, or it will sink down through them if it is above.

If the surface of peat mosses be properly dried, dressed with lime, and consolidated with earth and gravel, they will soon become productive. If the soil, whatever be its nature, can be drained to a certain depth, it is of no consequence what water may be lodged below it. It is only when it rises so as to stagnate about the roots of plants that it is hurtful. Land may be drained, so much as to be deteriorated in some cases.

When a single large and deep drain will produce the desired effect, it is much better than when there are several smaller, as large drains are more easily kept open, and last longer than smaller; but this is only the case in tapping main springs, for if the water is diffuse through the surrounding soil, numerous small drains are more effective; but as soon as there is a sufficient body of water collected, the smaller drains should run into larger, and these into main drains, which should all, as far as practicable, unite in one principal outlet, by which means there will be less chance of their being choked up. When the water comes in by the side of the drains, loose stones might be laid in them to a little above the line where the water comes in, and they may then be covered with sods cut off the surface and with earth.

The third branch in the art of draining is the removal of water from impervious soils which lie flat, or in hollows, where the water from rain, snow, or dews, which cannot sink into the soil on account of its impervious nature, and which cannot be carried off by evaporation, runs along the surface and stagnates in every depression. It requires much skill and practice to lay out the drains, so as to procure the greatest effect at the least expense. There is often a layer of light earth immediately over a substratum of clay, and after continued rains this soil becomes filled with water like a sponge, and no healthful vegetation can take place. Open drains should be made in the most suitable situations, and if the land is ploughed into well formed ridges, the furrows between the ridges may answer all the purposes of under drains, and convey the surface water into the main drains.

Though much of the lands of Canada are very level, yet in the most level field, there is generally an inclination in some direction. It is necessary to ascertain in what direction the greatest fall may be had, and to cut the drains so as to obtain the full benefit of the fall. Drains cannot always be in a straight line, unless the ground be perfectly even. They should, however, never

have sudden turns, but be bent gradually where the direction is changed. The outlets of all drains should be carefully kept clear, for wherever water remains in a drain, it will soon derange or choke it. Cross drains should be so arranged or turned, that the outlet shall meet the main drain at an obtuse angle towards the lower part where the water runs to. A drain brought at right angles into a ditch must necessarily soon be choked by the deposition of sand and earth at its mouth.

The following is an article on the same subject from the *Quarterly Journal of Agriculture*:—At the conclusion of our last thoughts or draining (vol. vii. p. 533.) is expressed a sentiment which cannot be too emphatically impressed on the minds both of landlords and tenant, that draining is the first step towards the improvement of the soil, which, if neglected, and the soil permitted to remain, not only in its natural, but in a half cultivated state, all other means of fertilizing it will only prove comparatively abortive in their application. Were draining thoroughly effected, all the present undrained but improveable soil of the country would be rendered capable of receiving all the benefits derivable from numerous indirect modes of fertilizing it. These various modes of fertilizing soil, were enumerated to be ploughing, dung, lime, and bone-dust, and these subjects were recommended as interesting topics of enquiry for another paper. It is our purpose now to prosecute that enquiry.

1st, *Ploughing*.—In ploughing undrained land, particularly land resting on a wet subsoil, the attention of the ploughman is constantly exercised, otherwise the plough may be thrown out at one place, and dip deeper at another, without any apparent cause for the diversity of its action. There is, however, a paramount cause for it. The texture of soil, however homogeneous it may appear at the surface, greatly varies where the soil rests on a *wet* subsoil, in being consolidated at one place, and loose at another; and of course in being hard and soft at different places. The hard portions become dry by the expulsion of water, by the compression of the soil, and the porous portions remain constant receptacles of superfluous water. Small stones become firmly imbedded in the hard portions of the soil, and are loose, and apt to be pushed before the plough in the soft portions. The plough, through these alternate changes of hard and soft, wet and dry portions of the soil, requires the utmost attention in its guidance: the hand and the eye of the ploughman being constantly in requisition, during the operation, to prevent the plough being thrown out or burying itself. But even with attention, such ploughing is unequally executed, and therefore unsatisfactory: whilst the disagreeable nature of the work tends to fatigue the body, and irritate the mind of the ploughman, and the unsteady draught occasioned

by the unequal state of the soil, jades the horses more severely than the extent of the work performed. Great discomfort, both to men and horses, attends ploughing soil in such a state, at any season, and it is only less irksome than the danger which both run of injuring their health. Ague and consumption affect the men, whilst cholera and inflammation of the bowels not unfrequently cut short the existence of the horse. That this is no exaggerated result can be attested by all farmers of wet land. But the evils of wet land are not confined to the annoyance of men and horses, they obviously affect the state of the cultivated soil, the nature of work, and the condition of crops. With regard to wetness affecting the state of cultivated soil, whatever labour and manure may be bestowed upon it, it always seems poor, hungry, weeping, and is apt to become foul with the strong ramifications of semi-aquatic plants, threading themselves in all directions through it. Being inelastic, its surface permanently imprinted with the hoofs of animals, and consequently, easily poached. Of the nature of the work on soil in that condition, the furrow-slice in breaking up lea, is not easily laid over with the ear of the mouldboard, its under edge adhering tenaciously to the subsoil, the vegetable matter in the soil becoming, in fact, a kind of incipient peat. When the furrow slice cannot be easily laid over, the slices never clap close together. The harrows rather make scratches over the furrows slices than cut them in pieces and blend them together, and the roller compresses such land so as to deprive the sown crops of the power of spreading their roots in it. As to the effects of wet land on crops, they consist of stunted growth of straw, or should a flush of vegetation be at any time encouraged by the state of the weather the grain in both cases is lean, thick-skinned, and light. The grass too, is short, wiry, and inclined to acidity, instead of being mucilaginous and saccharine in quality and taste, or rather the finer grasses disappear and coarse semi-aquatic kinds occupy their places.

Thoroughly drained land, on the other hand, can be easily worked with all the common implements. Being all alike dry, its texture becomes uniform; and being so, the plough passes through it with a uniform freedom; and where ordinary-sized stones obstruct its course, the plough can easily dislodge them. The plough by its own gravity tends to raise a deep furrow, and the furrow on its part, though heavy, crumbles down and yields to the pressure of the mouldboard, forming a friable, mellow, rich-looking mould, not unlike the granular texture of raw sugar. The harrows, instead of being held back and starting forward, swim smoothly along, raking the soil into a smooth uniform surface, entirely obliterating the prints of furrow marks. The roller compresses the surface of

the soil, and leaves what is below it in a soft state for the expansion of the roots of plants. All implements are much easier drawn, and held or driven on drained land; and hence all the operations on it can be executed less laboriously, and, of course, more economically and satisfactorily than on undrained. Much has of late been said of deep-ploughing in connexion with drained land. Deep ploughing we conceive to be a safe practice under every circumstance. It acts as draining to wet land, which of course must be very temporary in its effects. Its efficacy can only be fully developed on land that has been drained. There it forms the indispensable supplement to draining. It opens an easy access for light and air to the roots of plants, and facilitates their combined beneficial influence on the ingredients in the soil which go to support vegetation. These are all natural consequences of deep ploughing in the ordinary state of land; but these consequences will only be permanently observed and felt on thoroughly drained land. It matters not in what manner the soil is deeply stirred, the benefits of it will be derived in any case. The common plough with four horses, or a plough made a little stronger for the purpose, will stir the soil that is *thoroughly* drained, deep enough for the rumination of the roots of all plants raised in agriculture. Such a plough is equally efficient as any subsoil plough. A soil thus stirred one foot in depth will afford sufficient scope for the roots of most cultivated plants, and even fusiform roots will penetrate beyond that depth in a subsoil that has been thoroughly drained. It matters little, we conceive, whether a drained subsoil is brought up by the plough or no. We are sure it can do no harm when brought up, for it can be made the medium of conveying nourishment to plants as well as the upper soil. Both may be blended together for the common object, and, in a short time, neither can be distinguished from the other. By this property of drained land, we anticipate a general and increased improvement in soil, such an expansion, in short, of capabilities as to yield more abundant crops with the ordinary quantum of labour and manure.

2. *Dung*.—The baneful effects of undrained land on farm-yard and other matter commonly called manure, are most obvious. The perceptible dampness in undrained soil, dissolves the soluble portion of farm-yard manure, which, by gravity, descends beyond the reach of the rootlets of young plants; whilst the strawy portion remains undecomposed for a length of time. This statement may account for the invariable languid vegetation of plants while young in undrained land. After the straw has been decomposed, and vegetation been forced by the advancement of the seasons, the plants derive nourishment not only from the decomposed straw, but probably also from the soluble matter which had

previously descended through the damp soil. Vegetation is thus promoted in summer, but it is generally too late for that season to foster the plants to full maturity. The lateness and immaturity of crops on wet land may thus be explained. The fact is, wet land cannot be put in heart with manure to a sufficient degree to force vegetation without the assistance of the season. These effects on manure will be similar, whether the manure has been applied broadcast or in drills; but as the drill system deposits manure in larger masses on the same extent of ground, the effects will always be found to be comparatively less prejudicial to drilled than to broadcast crops. As an instance in point, potatoes cannot be successfully raised on wet land, when the manure is spread broadcast on the ground in Autumn or early in Spring. Before such a practice can succeed, the land must be in heart. But even in drills, on wet land, the manure will be decomposed in different degrees and at different times. The driest portion of the soil will first and most effectually decompose the manure, the hardest next in degree and time, and the wettest will retain it in a state of maceration, as long as the water is unevaporated by drought. Besides manure remaining inert in wet land, it also remains inert in such land rendered dry by drought. In that predicament the manure is undecomposed, and easily separated from the soil, which becomes, like a sterile powder; and remains so until the return of rain. Were the rain to fall in moderate quantities, the decomposition of the manure would be rapidly hastened in the warm soil, but if in inordinate quantities, its decomposition would be retarded as effectually as by the drought, although in this case it would be dissipated before decomposition. Nothing can so convincingly prove the benefits of draining in immediately securing the fertility of manure to the soil, than in contemplating the baneful effects of too much drought or moisture. And to render the proof the stronger, we have only to contrast these effects with the effect of drained land on manure. The moment that manure is deposited in a proper state, that is in a state of humidity in drained land, its juices are absorbed by the dry soil, and retained there as in a wet sponge half squeezed. The strawy portion being thus deprived of moisture by absorption, and still surrounded with comparatively dry soil which retains heat within itself, and readily absorbs more from the air, it is readily decomposed, and soon becomes intimately blended with the soil. Food in a semi-moist state is thus placed near and ready prepared for the tender spongioles of plants to exist upon; and supposing the weather no hotter but only equal to that we have supposed in the case of manure deposited in undrained land, the progress of vegetation will completely outstrip that in the latter.

3. *Lime*.—Many farmers consider lime a man-

ure, and talk of it as such, but it cannot be a manure, that is food for plants, in the caustic state in which it is desired to be applied to land, however it may be changed in its nature by admixture with the soil or exposure to the air. Caustic lime would soon destroy vegetable life. Instead of itself being a manure, it rather converts other substances into manure which would otherwise have remained in an inert state. It acts on vegetable matter on all soils, and, by decomposition, renders that matter fit food for plants. This is its chemical mode of action. It also acts mechanically, by separating the particles of adhesive soil by desiccation; but it is not probable that it acts chemically on the earthly portions of any soil. Confounding these properties of the action of lime, when applied to soil, with one another, might lead us to form erroneous conclusions regarding them. When, for instance, we observe lime to act with effect on vegetable matter lying inert in soils, we might conclude that it would be applied with best effect to wet land, in which vegetable matter is most abundantly found to be inert. When lime is found to pulverize and to dry clay soil become hard and cloddy with moisture, we might conclude that wet clays would derive most benefit from lime. Both these conclusions would be decidedly erroneous. Because, although lime readily decomposes vegetable matter in soil, it only decomposes it advantageously in dry soil, or rendered dry by draining, the moisture in wet land rendering the lime effete before it has time to act chemically on the vegetable matter in the soil; and lime only acts beneficially on drained soil, that contains excess of vegetable matter. Many dry soils, and particularly wet soils when drained, contain excess of vegetable matter, which matter although encouraging a flush of vegetation, is deficient of silica to harden the straw and fill the grain. Caustic lime converts a portion of this soft vegetable matter into silica, whilst it converts another portion of it into a pabulum, by which vegetation is powerfully supported. In like manner, the application of lime to wet clays would be to convert them into mortar, which would harden the soil in drought that was intended to be pulverized. Even in the case of top-dressing grass with lime, which is an excellent practice when performed aright, pasture in a constantly swampy state can derive no benefit from it. Before the application of lime therefore, in any circumstances, land should be thoroughly drained.

4. *Bone-Dust*.—The extraordinary power of crushed bones, when mixed with the soil, to promote vegetation, has not yet been satisfactorily explained. The finer the bone-dust, and the more intimately it is mixed with the soil, the more active is the vegetation. That the bone is chemically decomposed in its union with the soil is obvious. Lift up a handful of earth

in which bone-dust has been mixed for some days, and it will be found to be saturated with a rich oily substance, which makes the earth adhere together into a ball when squeezed in the hand; and this effect will be observed although the bones should have been boiled previously to being crushed into dust. It is hardly conceivable, *a priori*, that so small a quantity of any substance, as of the bone-dust when used, should be able to procure so sensible a change on the soil immediately in contact with it. We cannot positively assert which of the ingredients of the bone-dust it is that constitutes the food of plants, for although the circumstance of boiled, crushed bones being as good manure as those in a raw state, would support the belief that it is not the oily matter in bone which constitutes the manure, yet the fact that boiled, crushed bones render the soil apparently as rich with oil as raw, forbids us from asserting that the phosphate of lime alone constitutes the food of plants in bones. But whatever the chemical action of bone-dust on soil may be, we can assert with confidence, that bone-dust will impart no richness to any kind of soil, unless the soil is either naturally dry, or has been drained; and when soil does require draining, the more thoroughly it is drained, the greater effect will bone-dust have upon it as a manure.

We thus see, that unless land be thoroughly drained, all the adventitious substances which are employed to render it fertile, cannot impart their fullest benefits to it. Since this is the case, it is lamentable to think what vast quantities of manure, which take much time to collect, and much money to purchase, are yearly wasted on undrained land! How much more produce might not these quantities of manure annually raise, were they applied to land rendered fit to receive them by thorough draining.—*Quarterly Agricultural Magazine*.

SPRING TARES OR VETCHES.

In Dorsetshire, farmers have a practice which deserves notice, it is the following :—After the clover is fed off early by sheep, the land is then ploughed about the end of May, or beginning of June, and sown with rape and spring tares, which give an abundant produce in Autumn, on which the sheep are folded, and the land is thus well prepared for wheat. A bushel of tares or vetches, and two quarts rape-seed is sown on the acre. The crop is fed off by the beginning of October.

In Canada, land that is ploughed in the Fall, intended for the summer fallow the next year, might, in Spring, be sown with tares and rape-seed that would afford in July, August and September, a considerable quantity of provender for stock, when the pastures may be very poor. The land might be cleaned off in the latter end

of September; manured if necessary, and ploughed and prepared for a Spring crop. The tares and rape would not impoverish the soil much, and if they covered the ground well they would effectually prevent the growth of weeds.

This practice might be introduced without any difficulty, and we have no doubt that farmers would find it profitable, provided the tares and rape were sown in time, and fed off judiciously by stock, so as to allow the land to be ploughed and prepared in the Fall for the succeeding Spring sowing. If tares were sown alone without rape, they might be cut when green, and dried and preserved for Winter food for stock. In good weather they might be sufficiently and readily dried to keep perfectly safe. We might thus add very considerably to our stock of Winter and Summer food for cattle, and at the same time keep our land cleaner, and in higher fertility than we do now, and without any greatly increased expenditure. Such experiments as this will be safe for the farmer, though yet untried in Canada.

AGRICULTURAL MUSEUM, ROYAL DUBLIN SOCIETY.

THE Agricultural Museum of the Royal Dublin Society is now well worth the attention of the agriculturists, landed proprietors, and all others engaged in the cultivation and improvement of land.

In preparation for the late triennial exhibition, many models of implements and implements themselves of great value and interest were of necessity put aside, stored up, and huddled away in corners for want of space. Since the close of that great and interesting national exhibition, the whole of the apartments devoted to the Agricultural Museum have undergone a thorough cleansing, repairing, and renovation. The models and implements have been cleaned and painted, and to the former numerous collection of first-rate prize implements have been added all those that have been most approved of at the different shows and exhibitions which took place during the past season, including the prize implements. Here is to be seen the most extensive assortment to be found in any establishment in her Majesty's dominions of ploughs, harrows, straw-cutters, oil cake, pulse, and corn bruisers, drilling machines, manure distributors, liquid manure carts, and portable pumps, hand thrashing machines, rollers, clod-crushers, pipe-tile machines, &c., &c., in endless variety and by the first manufacturers in England, Scotland, and Ireland. The whole arranged in the most convenient manner for inspection and comparison, each being ticketed, named and priced in such a manner as to enable the agriculturist to select that which is most suitable to his wants and means. Every information can be obtained on

the spot from the curator, Mr. Corrigan, who has, with great taste, exertion, labour, and perseverance conducted the re-arrangement and classification of this most valuable national museum, so immediately connected with our national wants and prosperity.

COOKING AND DIGESTION.—A mixed diet of bread, meat, and vegetables, is better than any of the three alone; meat satisfies the appetite more completely and for a longer time than either of the other two; and, if a choice must be made between bread and vegetables, the bread should be chosen. Most kinds of game are easy of digestion. Roast beef and mutton are the most easy of digestion of all butcher meats. It is a fact worth remembering, that roasting and broiling are the modes of cooking meat which best suit the stomach: this is proved by a comparison of the time required for the digestion of different sorts of food. Thus, beef or mutton roasted or boiled, rather underdone, are digested in three hours—

Hours.	Hours.
Pork, broiled.....3½	Veal, broiled.....4
Salt pork, broiled.....4½	“ fried.....4½
Pork, roasted.....5½	Heart, fried.....4
Salt beef, cold, boiled.....4½	Rice.....1
Soft eggs.....1 to 3	Milk, boiled.....2
Hard-boiled, or fried eggs 3½	Bread.....3½
Venison, broiled.....1½	

Fruit and vegetables require from two to four hours, according to quality and mode of cooking. Potatoes roasted and baked, and raw cabbage, are digested in two hours and a-half; but boiled potatoes need another hour, and boiled cabbage, with vinegar, four hours and a-half. Here we see why some things disagree with the stomach when eaten; those which stay the longest are the most troublesome. Vegetables, in general, afford the least nutriment, and they are mostly passed on from the stomach, without being fully digested. This has been proved in several instances which have occurred of patients with openings leading out of their bowels just below the stomach; when they had eaten meat it could not be distinguished as meat by the time it reached the opening, but spinach, carrots, and other vegetables were but little altered. M. Londe, the medical attendant, says, “In my patients, salads, prunes, apples, and spinach, always appeared at the end of an hour, while the animal food never reached in less than three hours. It seems as if the digestive canal, anxious to get rid of the vegetables, from which it could extract nothing, and always contracting to drive them away, took the opportunity which the accidental hole afforded of expelling them altogether while it retained, by a sort of a predilection or elective attraction, the animal matter which could repay the expense of its labor.” Soup is not wholesome or digestible unless eaten with a good portion of solid food;

where children are fed largely on soup, their health suffers in some way. In several work-houses and Poor Law Unions, the use of pea-soup has been discontinued, as it was found to render children liable to disease of the mesentery. Fish, in general, is easy of digestion; and is good for those to whom meat would be too stimulating. Bacon, also may be eaten, as rashers, toasted in front of the fire, or broiled; but, as a rule, boiled salt meats are best avoided. Veal, pork, hot butter, and pastry, are more or less indigestible, and, consequently, to be eaten with caution. The mischief of pie-crust consists in the fat with which it is prepared. Some persons make it with flour and water only, as a cover to the fruit; it is then harmless. The chief good of a pie, however, is in the refreshing qualities of the cooked fruit.—*Fam. Econ. omist.*

IS LIME INDISPENSABLE TO THE FERTILITY OF A SOIL?

The practical farmer in nearly all countries has been accustomed to add lime to the soil; but can lime not be dispensed with? Is there no improved mode of culture by which the use of lime may be superseded? There are several considerations from which an answer may be drawn to this question.

1. Extensive and prolonged experience has shown that the fertility of many soils is increased by the regular addition of lime—that the surface of whole districts even is sometimes double or tripled in value by the addition of lime alone—and that, if it be for a series of years withheld, such soils become incapable of producing luxuriant crops.

2. All naturally fertile soils are found upon analysis to contain a notable proportion of lime; while in many of those which are naturally unproductive, the proportion of lime is comparatively small,

2. A naturally productive soil, even though regularly manured, is often found, after long cropping to become incapable of growing particular crops in an abundant or healthy manner. On analysis these soils are not unfrequently found to contain only a very small proportion of lime. After an addition of lime to such soils, the diseased or failing crops often grow again healthy and in abundance.

4. Lime added to one part of a farm sometimes produces no visible effect, while upon another it greatly increases the produce. In such cases, a chemical analysis not unfrequently shows, that those soils or fields on which it produces no effect already contain a sufficient supply of lime, and in the state most favourable to fertility.

Thus barren, sandy soils often admit of profitable cultivation after lime has been added; and clay soils, in which little or no lime can be de-

tected, are often entirely changed by the addition of lime. So, also, it may usually be laid with profit upon soils formed from decaying granite, while its action is frequently less sensible when applied to soils of decayed trap. This is chiefly because the granite contains little lime naturally, while the trap rocks for the most part abound with it.

These practical considerations, all lead to the conclusion, that *lime is really indispensable to the fertility of the soil.*

5. This conclusion, drawn from experience, is rendered certain by the fact, that all the crops we raise, contain lime, which they derive solely from the soil. To this fact I shall hereafter more particularly advert, when treating of the purposes served by lime in the soil,—*Professor Johnston on Lime.*

ON THE NUTRITIVE VALUE OF OAT HAY.

On Oat Hay, and the relative value of oats cut green and cut fully ripe," by Dr A. Voelcker, Professor of Chemistry in the Royal Agricultural College at Cirencester.

In the present case, Dr. Voelcker seems to have happily united science with sound practical views, and we constantly have intelligible and reliable statements from him.

The first point to which attention was directed, regarded the proportion of water contained in the straw and grain of the ripe and unripe oat respectively; both samples being of the same variety and taken from the same field. As might have been expected, the green oats contained most water; this is shown by the following table:

OATS FULLY RIPE.

Per centage of Water.		Proportion of Straw to Grain.	
Straw.	Grain.	Dry Straw.	Grain.
38 48	20 65	37 56	40 44

OATS CUT GREEN.

5.33	28.66	65.43	34.56
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I have taken the mean of the various results, given, as some discrepancy appears in the single determinations. By this table several general conclusions are indicated—

1. That the proportion of water in the unripe plant is greatest.

2. That the proportion of the dry straw in the unripe plant is greatest.

3. That when the plant is dry, the grain bears a larger proportion to the straw than would have been imagined; being even, in the green plant, more than one-third of the whole weight, and in the dry plant nearly one half.

The next step taken by Dr. Voelcker, was to determine the nutritive value of his several samples. In this case regard was had only to the amount of nitrogen contained in them, that being considered the most important ingredient in estimating any particular variety of nutritious

food. He calls the body in oats which contains nitrogen, by the general name of protein; this name applying to a class of bodies that contains about as much nitrogen, and that are about as nutritious, as lean meat when it is dry.

The proportions, or percentages of protein obtained by Dr. Voelcker were as follows:—

I. OATS FULLY RIPE.—MEAN RESULTS

Grain, 15.30 per cent. of protein compounds.
Straw, 8.46 " " "

II. OATS CUT GREEN.

Grain, 17.87 per cent. of protein compounds.
Straw, 21.01 " " "

No. II. was cut when the stalk and leaf were yet quite green, and the grain milky, but fully formed. They were cut at the same time, the green oats having been sown about one month later than the others.

The conclusions to be drawn from the above results are not only extremely interesting in a scientific point of view, but are of much practical importance.

1. We see, in comparing the numbers in the ripe and unripe straw, that the latter contains $3\frac{1}{2}$ per cent. more nitrogen than the former.

2. That the unripe grain also contains more nitrogen, this may seem a very strange result but may be explained when we consider the fact, that the unripe oats, although they had not attained their full bulk had received most of their nitrogenous compounds, and that the after increase, while ripening, must have consisted mainly in an accumulation of starch, and other non-nitrogenous bodies.

In addition to the facts established by these analyses, it is borne in mind, that the unripe straw is also much richer in starch, gum, sugar and other compounds of the same nature, all of them both nutritious and easily digestible, but which are for the most part, in ripening, gradually converted into woody fibre.

Here too, the larger quantity of water which has been already shown to exist in the unripe straw, is to be brought into account. This water helps to render the food more soluble, and more easily digestible by the animal. We find then that an equal weight of the unripe straw and grain contains more nitrogen, more sugar and gum, and also more water; so that while it is more nutritious, it is also at the same time more easily assimilated and digested by the animal. This last is a point of more importance than is usually imagined. Of two kinds of food containing equal quantities of nitrogen, one may be vastly superior in its effects when fed, and this simply because it can be readily digested; a large portion of the other may even pass through the body unaltered.

Dr. Voelcker gives, in addition to his theoretical results two letters from farmers who have seen oat hay tried. One of them says, "that

when cut fine, oat hay goes one-fourth farther than if the oats and straw had been allowed to ripen."

In many parts of the country, it is very difficult to produce good grass for cutting, but easy to grow quite tolerable oats, at least so far as bulk of straw and appearance of head is concerned. The grain was not filled out as well as if allowed to stand, but still would serve a good purpose as fodder when cut green and made into hay. There is no loss of the grain by shelling when cut in this way and the hay would be highly relished by stock.

NUTRITIVE VALUE OF THE DIFFERENT CROPS.

—CABBAGE.—The cabbage has lately been chemically examined, in consequence of the failure of the potato, with a view of its substitution for that root. It is found to be *richer in "muscle-forming matter" than any other crop we grow*. It contains more "*fibrin*" or "*gluten*," of which substance the muscles are made, and hence is richer in the material essential to the health, growth, and strength of an animal; wheat contains about 12 per cent. of it; beans, 25 per cent.; but dried cabbage contains from 30 to 60 per cent. of this all-important material, of which the principal mass of the animal structure is built.

An acre of good land will produce 40 tons of cabbage. But—

1 acre of 20 tons of drum-head cabbage will yield	1500 of gluten.
1 do. of 30 tons of swede turnips	" 1000 do.
1 do. of 25 bushels of beans	" 400 do.
1 do. of 25 bushels of wheat	" 200 do.
1 do. of 12 tons of potatoes	" 550 do.

Such is the variation in our general crops, as to the amount of this "*gluten*." *this special kind of nourishment*, this "*muscle-sustaining principle*," which accounts for the preference given by experienced farmers to the cabbage as food for stock and milch cows, although the crop impoverishes their land, which requires much manure to restore it to its former fertility.

OATS.—The grain of the oat plant is found on analysis to be richer in this gluten, this "*muscle-forming material*," than the grain of wheat, and oatmeal a better form of nourishment than flour. Hence the superior strength of the Caledonians.

BRAN is found to be richer than the interior part of the grain in "*gluten*," in "*muscle-forming material*"—which proves that our antiquated country dames indulge not in mere conceit when they persist in preferring good wholesome wholemeal-bread to the white loaf.

BUTTER AND CURD OF MILK.—A voice from the laboratory tells us that the butter and curd of milk correspond to the fat and muscle of the animal, "hence the reason why good milkers are generally poor, and why the milk decreases when they begin to fatten." Oily substances, given as food, in the animal economy become

clarified into butter, or spread over the bones as fat. If we want butter, we must give linseed or linseed-cake. If we want to fatten, we must do the same, or give other fatty substances, rich in oil, with their ordinary food. But if curd or cheese is wanted, then we must give beans or cabbage, or other food rich in "gluten"—*that always-to-be-remembered muscle-forming material*"—(applause.)

BARLEY AND MALT.—Late experiments have settled the question as to the inferiority of malt to barley in feeding cattle. Barley in the process of malting loses about seven per cent. of highly nutritive substances, and thus is its nutritive power diminished. But in malt there is a peculiar substance found, generated in the malting process, and of high solvent power, which greatly aids the digestion of other food, even when such malt is given in small quantities. One-tenth part of the barley devoted to feed stock may be used in the shape of malt. A small portion may be given, as a digestive, with dry food. A smaller portion still with moist food, like potatoes, may be given: the digestion will thus be improved, and the health of the animal ensured; while even in man the mastication of a little malt after meals would contribute to the digestive process.

SWINE.—The same remarks apply to the food of the hog. If we wish to promote proper development of the muscular parts, and of the bone, we must give food rich in the "muscle-forming material," and not deficient in the "phosphates"—cabbage, swedes with their leaves; and afterwards feed the animal with substances containing much charcoal, so that fat in moderation may be spontaneously formed: such articles are beans, oatmeal, barley, grains, &c. If we wish to transfer fatty matter already formed—to make the animal into a "kind of oil butt"—we must give, with other food, greasy substances—"tallow-crap," linseed meal, anything in short which contains the unclean fat we wish to be clarified and manufactured, by this most useful creature, into good wholesome lard (cheers.)

PASTURE LAND.—Every milk cow robs the land annually of as much phosphate of lime (bone-forming material) as is contained in 80lbs. of bone-dust. From this cause the Cheshire pastures became greatly deteriorated, but were restored to their former fertility by being well boned. Land continually repastured must be fed regularly with phosphates—by the application of bones, nightsoil, &c. Some description of lime contains phosphates in sufficient quantity, but not all. When the mountain limestone of Derbyshire, formed almost entirely of a conglomeration of fossil shells, and hence rich in phosphates, becomes accessible by railway, it will probably be found of great value to pastured land (applause.)

THE HIGHLAND & AGRICULTURAL SOCIETY.—The show of the Highland and Agricultural Society of Scotland, took place at Glasgow on Wednesday, Thursday and Friday. The place of exhibition was the King's park, or the upper part of the green—a spot admirably adapted for the purpose, alike for convenience and effect. The fine tall trees which skirted the sides of the enclosure, and separated in the midst, the implement and cattle departments, gave a pleasing appearance to the whole, while the dark luxuriant grass proved most agreeable to the numerous visitors. The weather was very auspicious—the first two days not a drop of rain fell, while the slight shower of the morning of Friday, only made the succeeding brightness more pleasant. The arrangements of the Directors were excellent; and the Show itself may be considered perhaps, the most successful which the Highland Society has had in its long and useful course. The only objections we heard were from some of our keen agricultural friends, who, embracing the earliest opportunity of entrance on Thursday, had not proceeded over half of the exhibition, before the crowds, entering at the reduced rates, prevented any thing approaching to a careful and minute inspection of the animals.

TO MAKE WHITEWASH.—As this is the time for cleaning up door yards, and whitewashing buildings and fences, we give receipt for making whitewash, which is said (in the *Horticulturist*) to be one of the best and most durable character. Take a barrel, and slake one bushel of freshly-burned lime with boiling water. After it is slaked, add cold water enough to bring it to the consistency of good whitewash. Then dissolve in water; and add a pound of white vitriol (sulphate of zinc) and one quart of fine salt. To give this wash a cream colour, add half a pound of yellow ochre in powder. To give it a fawn colour, add a pound of yellow ochre, and one-fourth pound of Indian red. To make the wash a handsome gray stone colour, add one-half pound of French blue, and one-fourth pound of Indian red. A drab will be made by adding one-half pound sienna, and one-fourth pound of Venetian red.

PRESENT TO HER MAJESTY.—Queen Victoria, is soon to receive a curious present from the Province of Posen, in Poland, as a token of gratitude for the protection granted by her to the Polish refugees. It is the fleece of a ram of very singular beauty, bred on the property of Count Ignatious Lipski, who is celebrated for his breed of sheep. This costly fleece is enclosed in a box with a glass lid, and on which is inscribed the genealogy of the ram in four languages.

Soul-cheering is it to live in an age when a thought is stronger than a sword, public opinion more powerful than a standing army, the people's mouth more potent than the cannon.

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AND
TRANSACTIONS

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MONTREAL, NOVEMBER, 1850.

THE CANADIAN INDUSTRIAL EXHIBITION—

Has at last been brought to a conclusion and we believe realized fully the public expectations. As it was not an Agricultural Exhibition, or rather we should say, one where Agriculturists were directly expected to exhibit their products, we should not perhaps, take upon us to make any particular report on the subject, except as a visitor like any other party who has seen the Exhibition. Indeed we feel that it would be an intrusion, were we to do more than simply to state that we conceive the Exhibition altogether, was very creditable to the Province, and to the parties exhibiting. We are quite incompetent to describe the numerous and excellent articles exhibited, as the greater portion of them had no direct connection with agriculture. The various samples of grain, wheat, oats, peas, and indian-corn were all of excellent quality. Several samples of cheese and butter were also very good. We did not pay such particular attention to the comparative excellence of the samples as to authorize us to mention the names of any exhibitor, nor should we consider ourselves justified in doing so, as the judges have decided who produced the best samples. The Montreal Press have already given such a full report of the Proceedings at the Exhibition, and all that was to be seen there, that it would be quite ridiculous of us, at this late period, to repeat all that has been written on the subject as we could not give it any new or better colouring than it has already received from our confrères of the Press. The Exhibition, we were rejoiced to perceive, was numerously attended by Canadians and strangers

who appeared greatly interested, and we have no doubt that the business portion of the Montreal citizens have every reason to be satisfied with their participation in the benefits of the Exhibition.

The County of Montreal Ploughing Match, took place on Mrs. Mills' farm, Côte St. Pierre, near the Lachine road, on Monday the 21st. October last. We believe there were 27 ploughs, of which, perhaps, about a third were French Canadian ploughmen, who ploughed in a separate field. All the ploughs were of iron, and what are known as the Scotch swing plough. The land was of the very best description for a ploughing match, and in good order, particularly the field for English ploughmen. The field for Canadians was stiffer clay, and not so easy to plough. The ploughing was exceedingly well executed by all, without exception. There was not an ill ploughed ridge in the whole of what was ploughed. The land ploughed is very accessible to any party who may be disposed to see it, and it is worth the trouble of going some distance to see it. The only objection, we conceive, that was to the mode of deciding the premiums, was that it did not appear there was any regard to the time occupied in ploughing the land assigned to each plough. It is a very material object to a farmer what quantity of land can be well ploughed in a day. In the old country, the land assigned to each plough was exactly measured and each plough had the same quantity. There was a certain time given to finish the work, and any party who did not finish within that time was disqualified, however well he ploughed, and the prizes were awarded to the party who executed the work in the best manner and shortest space of time, within the time given. This should be the rule at all Ploughing Matches, and four hours should be the longest time allowed to plough well half an arpent. Peculiar circumstances might occasionally justify a departure from this rule, but otherwise it should be general, on

land not very difficult to plough. We do not offer these suggestions to favour one party more than another as they would of course apply to all competitions. The visitors to the ploughing match were treated to a very excellent lunch, with abundance of beer, wine and brandy, for all who had not taken the temperance pledge. The whole affair was very creditable to the managers and to the ploughmen. The horses, harness and implements were excellent. We have never, in America, seen better ploughing, generally, executed at a Ploughing Match, and the unsuccessful ploughmen had very little less merit than those who were so fortunate as to be awarded premiums. We wish them all, life and health to come forward next year in a similar honorable competition.

At the late county of Montreal cattle show, we were sorry to observe that there was not one of the stallions exhibited for prizes that appeared to be of pure Canadian breed. This breed is so unmistakable in certain points, that the slightest cross with other breeds may be detected. A horse of pure Canadian breed has invariably, characteristic marks of that breed that can never be mistaken for any other. We conceive it to be serious matter of regret, that decided encouragement should not be given by Agricultural Societies for the pure Canadian breeds of both stallions and brood-mares. We do not object to prizes being offered for mixed breeds, but let there be always a separate class of prizes for pure breeds. Mixed and pure breeds should not be exhibited in the same classes. There is another objection which we have often urged, that is, to the manner in which animals are kept upon the place of exhibition. The animals entered in the same class are not kept together, but all classes, ages, and sizes are mixed together, and the judges who have to decide which are the best animals in each class, have to do so in the best manner they can from this mixture. We do not know how judges of cattle manage to decide correctly

under such circumstances, but we do know that we could not pretend to do anything of the kind. In the British Isles all animals entered in the same class are placed together to enable the judges to compare the merits of each accurately and properly. It may be difficult to induce exhibitors to conform to the regulations of Agricultural Societies, but no animals should be allowed to compete for prizes, but such as would be led to the shows, and could there be secured in their proper class that they were entered in. Cattle-shows should be so conducted that there would be an opportunity offered judges of animals to make a correct decision and award. It is not the opinion of judges of cattle that will make one animal superior to another, if it is not so in reality, and therefore if judges are prevented from making a correct award, there are other parties who will discover this error, and it has a tendency to do much harm. If it is worth parties while to take animals to cattle shows, they should not have any objection to conform to necessary regulations.

We attended at the District of Montreal Cattle show, held at St. John's, on Wednesday the 9th. October last, and were glad to perceive that a large number of domestic animals of every species, were exhibited, and many of them of excellent quality. The show of horses were numerous, but of very mixed quality. The horses entered in the class for "Best French bred Draught Stallions" were, as far as we could judge, all of mixed breed and we did not observe one that had the decided marks of the pure Canadian breed of horses. The show of what was termed "English bred Draught Stallions" was very superior, although we doubt that several of them should have been entered in this class. We counted 20 horses in the ring together in this class, for the judges award, and every one of them were fine looking animals. We never before, in America, saw so many fine stallions

We cannot say whether they were all the most suitable for draught or not) exhibited together. They were very much superior, as a class in appearance, to the class of French bred draught stallions, and this is altogether our farmers' fault in not preserving the breed of the Canadian horse in its purity. There were many brood mares, but of very mixed quality, and mixed breeds. We observed one brood mare of pure Canadian breed, and we should never desire to see a better specimen of brood mares for agricultural purposes. She was in every respect what we could consider the most perfect shape and size, for a powerful and enduring working horse, and undoubtedly possessed more *good points*, according to our estimation, than any brood mare we saw at the exhibition, although there were some others very good. The most objectionable mode of allowing all animals to be mixed up without keeping them together in the classes in which they are entered, prevents the possibility of making any just estimate of the relative merits of animals entered for competition in separate classes. The horses, however, were brought before the judges in their separate classes, but we did not see that distinct breeds were separated. There were many fine bulls, cows, and heifers of different breeds, scattered over the ground, and all varieties and ages mixed. This sort of confusion renders it impossible to form a correct estimate of the relative quality of the various breeds and crosses. With sheep it is the same case. There was the Leicester, South-down, Merino, and numerous mixtures of all these breeds, and, we believe, all allowed to compete in one class for premiums. We cannot even conjecture, how judges could award prizes correctly, under such circumstances. Leicester sheep may be very good as a separate variety competing in a separate class, and so may any other variety of sheep competing in separate classes. But why should we compare the Leicester with the South-down, Merino, or mixed breeds? What would be a perfection in one breed, would not

be a perfection in the other. Many farmers may choose to have different varieties of sheep but not for competition of the several varieties in one class at a cattle show. One variety of sheep may be more suitable and profitable in certain situations than another, but this circumstance should not determine to which variety the prize should be awarded at a cattle show. If there is only one general class of premiums for sheep, let the breed be determined that will be allowed to compete, and do not allow the different varieties to compete together in the same class. As well might goats and sheep be allowed to compete together! It is not acting with fairness towards parties who import South-down or Merino sheep, not to give them an opportunity of competing in separate classes for these breeds. If these varieties of sheep are pronounced by any Agricultural Society to be unworthy of encouragement they may be excluded from competition but under other circumstances, they are entitled to a fair chance of competition in separate classes for each variety. There may be very good South-down and Merino sheep, that would have no chance in competition with Leicester sheep, although they might be better of their kind than the Leicester. It is the same case with horses and cattle of different breeds, their owners can only be done justice to by having the various breeds competing in separate classes for each. The Ayrshire breed of neat cattle are not fit to compete with the Durham, nor are the Canadian breed fit to compete with either of these in the same class. There should be a separate class for each of the first two breeds, and always a separate class for Canadian or mixed breed to compete together, in order to show the effects of crossing, compared with the pure breed, that farmers may be able to determine the best course to pursue in regard to the breeding of neat cattle. We submit these remarks and suggestions for consideration, without any design to give the slightest offence to any party. We conceive it to be our duty to act in this way

while conducting this Journal. Our ideas may not be correct on these subjects, but we only offer them with a view that agricultural exhibitions may be conducted so as to produce the greatest possible amount of good to farmers, and that every exhibitor shall have a fair chance of obtaining the credit he may be entitled to. Any party who has had an opportunity of seeing a great Agricultural Exhibition in the British Isles, will understand how much better our Exhibition would appear if the animals were kept more orderly, and the different varieties and ages kept separate in the classes in which they were to compete. Our animals of every description would appear to much greater advantage, and our shows be worth looking at.

There is another observation we would offer on this subject. The true mode of determining the relative excellence of animals, is by endeavouring to ascertain the number of established, or generally admitted *good points*, and also the number of the objectionable or *bad points*, that each possess, and by comparing these marks of excellence and defects, a right conclusion may be arrived at by judges. This is a simple rule to act by, but we should be glad to be informed whether judges are able to adopt this rule generally at cattle-shows, or whether they have time or opportunity to do so, while the stock exhibited are mixed up in such confusion as they usually are, and scattered over a large space of ground. If animals were kept together in their regular varieties, ages and classes, one half the stock brought to show might at once be removed, as their owners would perceive that they had no chance of obtaining premiums, and this would relieve judges from considerable trouble, and difficulty in selecting the best animals. We conceive it to be a duty that all Agricultural Societies owe to the public that this matter should receive due consideration, and any remedies that may be necessary, introduced with as little delay as possible. While there is any attempt to class animals, there should be separate classes for each dis-

tinct variety, and the distinction should be strictly observed, or justice cannot be done to parties exhibiting stock.

We should be delighted to see an honorable competition entered into between the farmers of Lower and Upper Canada, as to which would succeed in raising the largest and most valuable produce from their lands. We conceive that this competition might be entered upon on equal terms, neither party requiring any advantage over the other. There may be some sections of Lower Canada rather too far north to be able to join in this competition, but with this exception we should have no fears for the capabilities of Lower Canada, to enter into competition in agriculture with any part of North America. This will be considered no doubt, a groundless presumption on our part, but we are prepared to sustain it. We do not pretend that we can dispose of the produce of an acre for as much money as can be had for the produce of an acre in many parts of the United States; we only state that we can raise, acre for acre, as much of the products of husbandry here, as in any part of North America, so far as regards the common crops raised upon a farm including wheat (perhaps) barley, oats, rye, buck-wheat, Indian corn, peas, beans, hops, hay, pasture, potatoes, turnips, carrots, parsnips, mangel-wurtzel, beets, every description and variety of garden vegetables—most of the varieties of fruits—dairy produce—beef, mutton, lamb, veal, pork, wool, honey, flax, hemp, horses, &c.

This is a numerous list to be thankful for, and we might add many more valuable natural products, such as, wood of every useful variety, sugar produced from a variety of this wood, fish and fowl in great abundance and excellence. Surely a country that produces all these good things and in full proportion to the care and skilful attention we bestow upon it, is one to be proud of. Who can dispute the list we have given above of our products? We

have seen good crops, and good products, of every thing we have enumerated, produced in Lower Canada. Let our farmers only exert themselves, and we can assure them that there is not one of these articles we have set down in the above list, that they cannot produce in as much perfection, as in any part of North America that we have seen, with the exception, perhaps, of wheat.

We hope it will not be supposed we desire to undervalue other countries, and over estimate Lower Canada because we happen to reside there. It is not so with us, we feel firmly persuaded in the opinion we have expressed, although it is possible we may be in error in some points. We would give up as hopeless, the improvement of agriculture in Lower Canada, if our farmers were of opinion that the climate and soil were unfavourable for improved agriculture, and that it would not be profitable to introduce improvement. It is doing the greatest injustice to the country, to give the climate or soil a character that is unfavourable to agriculture, as compared with Upper Canada or the neighbouring States. It is an old saying that, "the hills look green when far away," but were we to go to these hills, we might not find them so green or so pleasing as they appeared in the distance. It is so in respect to other countries than our own, we may hear great things, and most favourable accounts of them, but were we to leave our own country to seek these promised advantages that are at a distance, we might have reason to regret the change when too late to retrace our steps, or recover the advantages we had foolishly cast away from us.

If parties have succeeded elsewhere in realizing, or accumulating property, we are not without numerous examples in Lower Canada also, of parties having succeeded in acquiring considerable property, from scarcely any capital to begin with, and we know several of these parties that had not a dollar. We freely admit that a greater number of emigrants may have succeeded in acquiring property in Upper than

in Lower Canada, but the cause was, that generally the most skilful and enterprising emigrants settled in the Upper Province. We know very many instances of French Canadian farmers succeeding admirably—indeed, we have not known one of this class who has adopted an improved system of husbandry that did not succeed. These parties have been generally prudent, and taken good care of their profits, and the consequence is they are wealthy. When some parties, of all origins, can thus succeed under ordinary circumstances, there cannot be any fault to the soil or climate. What can be done by one party, can be done by another, under similar circumstances, if they adopt the same means of doing it. There is nothing connected with Lower Canada that should give it an inferior character, unless her population resolve to stand still when the order of the day in most other countries is to go ahead at all events.

A series of letters has been published lately in the *North British Agriculturalist*, upon English farming as compared with that of Scotland, by a Scotch farmer who has visited various farming establishments in England. These letters are very interesting, and give a high character of English farming, and candidly admit, that the English practice is equal, if not superior in many respects to that of Scotland. We know there are many parties in Canada who will be slow to believe this statement, but all who may doubt it, we refer to the *North British Agriculturalist and Journal of Horticulture*, an excellent paper, published in Dalkeith, Scotland, which may be seen at the office of the Lower Canada Agricultural Society. The writer of these letters describes the English farming, and points out in what respects he thinks it superior to Scotch farming. This is the fair way of giving an opinion by stating the grounds upon which it is founded. We believe there is no part of the world where farming in every department, is carried on in

greater perfection than upon an extensive English farm. We include everything, farmhouse, farm-buildings, the tillage, meadows, *pasturage*, horses, neat-cattle, sheep, swine, and rearing and feeding of stock; dairy implements, fences, and trees, the whole establishment is superior to any thing to be found elsewhere. We conceive that a fine old pasture stocked with beautiful animals, is one of the greatest ornaments of the farm. There is nothing artificial about it. Animals enjoy themselves delightfully on a fine old pasture that becomes covered with a great variety of the best of grasses. No matter how well land is cultivated and manured, new pastures of one or two years growth or standing, are never so good for cattle as old pastures; if the land is of good quality. The constant tillage of land without rest, in grass for more than a year or two, under, however good management, will ultimately injure the soil, break the staple of the land, so that it will not produce healthy and full crops of grain. This is said to be the case with much of the lands in Scotland at this moment, that they have been too long and constantly cropped, and lime applied to them, to make them give out every thing that is in them. We have seen the effect of this constant cropping, and we are certain it has a most deteriorating effect upon the soil, however well manured. Previous to potatoes becoming diseased, we raised a large quantity annually, and our practice invariably was to plough in the Fall as early as possible, after meadow or pasture, and give the land, again in the Spring, a cross ploughing, and if this did not break it sufficiently, give it a second ploughing, and then plant it in potatoes with manure. The following year, this land was laid down with wheat or barley, thus only taking one green, and one white crop, and once manuring. The land was consequently laid down in good condition. If kept in meadow, it was top dressed every second year, pastured occasionally, and not ploughed again for seven or eight years.

There was more labour by this method in preparing for the potato crop, but we found that the potatoes had not much weeds, were always good in new sod land, the crop of grain, good, and the land laid down in good heart. In any system of rotation that would be established here, we think it would be desirable that for every two or three years that land would be kept in tillage, it should be left for six or seven years in grass. The roots of the grass would then, when ploughed up, be a considerable assistance to manure the soil. If farmers would, the first year that grass land was broken up, sow it with peas and oats; the second year, manuring all they could of this land for green crops, such as potatoes, beans, mangel-wurtzel, turnips, carrots, parsnips, indian corn, &c., and Summer following the remainder; the third year the same land might be seeded down for grass, with wheat or barley, and not ploughed again for seven years. This is a simple rotation that any farmer might adopt, and we do not know a better or more suitable for Canada. Of course, if the farm is too small to allow the land to remain so long under grass, the tillage should be increased and the period under grass diminished to three, four or five years, as the case may be.

This Fall has been very favorable for ploughing and draining, as there were not many days wasted by bad weather. It was also a good time for top-dressing land, as the soil was not over saturated with moisture, and would not be cut up with cart wheels. We have frequently recommended the mixing of soil as one of the most certain and lasting improvements. The sloping of drains, and the banks that are so often formed on the edges of the drains, are well adapted for compost heaps, to be mixed with other substances, and might be carted to convenient situations, without much trouble, to be made use of as opportunity serves. There may be parts of the farm where the sloping, &c., might be carted at once to mix

with different soils, such as sand with clay or moss, or clay with moss or with sand. Where marl of good quality can be had conveniently, it is a good mixture with sandy or clay soils, but it requires a considerable quantity to produce any useful effect.

Experiments are frequently made in all these matters, and when they do not succeed, the plans suggested are condemned as mischievous expenditure, without any useful result. The fault, however, is very generally to be attributed to the imperfect, and insufficient manner in which experiments are executed. It would not be expected that any great effect would be produced by a slight dressing of different soil, because the application of a small quantity does not sufficiently change the nature and texture of a soil to produce much improvement in it. There must be a considerable dressing to make any permanent improvement, if it is the nature of the soil that has to be changed. Where this improvement is attempted the soils should be well mixed up by frequent ploughings, or by Summer fallow which is the best of all to bring mixed soils into a state of production. Lime would also be an excellent addition when dressing one soil with another. Sufficient draining of land that was previously wet, has the effect of changing the nature and quality of its productions and making it altogether of much more value.

We have constantly advocated the advantage of preserving a proportion of the native forest trees on every farm, and when they have already been destroyed, that more trees should be planted in suitable situations. This country is so very favourable for fruit trees, and of other trees the maple might be planted principally, which would in a short time yield valuable products to the farmers. There is not a farm in Canada that would not yield fruit, were the trees planted properly. Where the soil might be unfavourable in its natural state, it would be possible to make it suitable by draining and mixing the

soil, placing stones under the roots of the trees, or planting the trees upon the surface of the soil, and raising mounds about the roots, so that the roots shall be altogether over the surface of the soil. We offer these suggestions to induce farmers to make the experiments of planting fruit trees, even where they might conceive the soil not to be favourable. The climate we know to be favourable for the production of fruit, and we believe the soil is in the power of the farmer to be so improved by artificial means, as to be made suitable for the healthy growth of fruit trees, indeed, we have no doubt of this. There is every inducement to us to plant trees where they are wanted for shade, for use, or for ornament. There are many cases that it is very difficult to preserve the natural forest, or any part of it, but it is always in our power to plant young trees, that will soon become of good size, with the rapid growth of this country. Hedges might also be cultivated for fences, and we have the means here to plant them at once by taking young plants from the forest of suitable species, or by growing the native white thorn from the seed or haws, which should be gathered and sown in the field in seed beds, from which they can be removed when two or three years old. The haws should be sown now in drills, about a foot apart, to admit of the soil and young plants being kept clean, until trans-planted to where they are to form the hedge. There are several varieties of nut trees that might be planted, that would yield an annual produce, and are suitable for shade and ornament. The butter-nut is a very handsome tree, and is useful for its wood and its fruit. We shall in a future number give the names of various nut and other trees that might be planted. There is very little doubt that it is most injurious to the country that has been naturally covered with a forest of beautiful trees, to have them all cut down and destroyed, without being replaced to a certain extent by other trees. It is said that in other countries the lands have been rendered sterile, and

almost useless, by destroying all the trees upon them. From whatever cause or by whatever means, it is certain that a reasonable proportion of trees improves the climate of warm countries, makes them more fertile, and more suitable, and healthful for man and for domestic animals. We wish there was a law to compel the planting of trees where there are no trees upon the farm. It appears to be a degree of vandalism for us to come into a country, covered with majestic forests of every variety of trees, and cut them all down, burn and destroy them wherever we settle. We have only to compare a country that is sufficiently wooded, with one that has scarcely a tree upon it, and the difference is most striking. The first is a paradise, the latter is only a desert. Farmers may object to the waste occasioned by trees, but we are convinced that a good farmer might very well spare the land occupied by the trees, necessary for a farm, if he was to cultivate, and occupy properly all the other parts of his farm. We cannot admit there is any valid excuse under any circumstances, for the total destruction of our trees without planting other trees in their place.

WHEEL AND SWING PLOUGHS.

There is a very considerable difference of opinion exists respecting the merits of the wheel and swing ploughs, and we believe their respective merits have not yet been tested in Canada, by fair competition in the field. From having had a trial of both ploughs upon our own farm, we can state from experience, that each plough has its fair proportion of merit. In land that was in good order for ploughing, free from stones, or other impediments, we would prefer the wheel plough as more easy to manage, and more sure to cut and turn over, perfectly, the furrow slice. The swing plough would answer best in land that was not free from stones or roots, and in fact is an excellent implement on any lands, in the hands of a man, who knows how to use it properly. We im-

ported the best description of wheel plough from England with the object of introducing some necessary improvement in the Canadian wheel plough. We have ever considered it more judicious to endeavour to improve the implements we find in general use in a country, if susceptible of improvement, than to attempt a total change at once. We have frequently seen excellent ploughing by the Canadian wheel plough, much better ploughing, than we have seen executed by some swing ploughs of high pretensions. We have no hesitation in stating that the Canadian wheel plough might be improved so as to be an excellent and suitable implement for the strong clay lands of Canada, and we should be very far from recommending Canadian farmers, generally, to put away their wheel ploughs for swing ploughs, until they find out by their experience where it would be prudent for them to do so. The greatest objection to the wheel plough is the great width they give to the furrow slice, compared to the depth, but this might be corrected by the ploughman, as it is by no means a necessary consequence of the wheels, that they should make a disproportioned furrow slice. We have seen wood swing ploughs turn as broad and as shallow a furrow slice as a wheel plough, and at a ploughing match too. Crooked ridges and furrows are not a necessary consequence of using a wheel plough any more than if a swing plough was made use of. If the farmers generally made use of the swing plough, we would not be the first to recommend them to adopt the wheel plough in stead of it. But we shall never admit that the Canadian wheel plough retards the improvement of our agriculture, and we think it very injudicious at ploughing matches, not to have a class of prizes offered to them for competition. If the ploughs are bad, this would be the proper way to convince their owners that they were bad, and if otherwise, they should have the merit they deserve. We confess we would be inclined to question the

judgment and good sense of any party who would condemn an implement before its merits were fairly tested, particularly any one that had been long in use. The wheel plough we imported from England which was of the same make as the wheel ploughs that was awarded the first prize at the great annual Exhibition of the Royal English Agricultural Society for several years where ploughs of every make were in competition, has been condemned in our presence as worthless, by parties who have never seen such a plough at work. One would say it was too heavy, when we know it is lighter of draught than any iron swing plough; another would observe that the wheels would sink in the soil. This last objection is absurd, because the soil when unfit to bear the wheels would be unfit to be ploughed, and if too soft for the wheels, it would certainly be too soft for the horses' weight, that would be much heavier than the wheels. Caution in adopting a new implement, never before in use, is very proper, but for us, in Canada, to reject, without testing, a plough that is in general use in England, (that is *unquestionably*, the first agricultural country on earth,) because it is not the sort of plough we make use of, is, to say the least of it, a great absurdity. A good ploughman will be able to cut a furrow slice of proper proportion with a swing plough, but with a wheel plough, a man who would not be so experienced might turn as good a furrow slice, and would not be so likely to leave any of the slice uncut. We have never seen a plough cut a cleaner furrow than the wheel plough we imported. A well ploughed ridge, should, if all the turned surface was removed, be perfectly level and without the slightest inequality appearing. This is necessary in order to allow the water to escape from the ploughed soil into the furrow. They must be good ploughmen, who with a swing plough, will have a perfectly smooth surface under the furrow slices. There are great objections made to the Canadian Wheel Plough, but they are, in many instances, groundless.

In our humble endeavours as Editor of this Journal, it has constantly been our most anxious desire to conduct it so as to make it useful to Agriculturists, and promote, if possible, the profitable improvement of Canadian husbandry. We have carefully excluded all political and party discussions, and every subject that might give offence. Our views on Agricultural subjects may not be in all cases correct, but we should have been most happy to give insertion to any communication that would have differed from our views, and be thankful for any instructions offered. Although we have spent a long life employed in Agriculture, we see there is much to learn every day, and we are as willing to be instructed now as when a boy. During the many years we have employed ourselves occasionally in writing on Agricultural subjects, we have been favoured by the approbation of many whose approval we set the highest value upon, but we regret to have to say that we have also met with many discouragements, and from parties who we might reasonably expect would countenance and support us, in our humble exertions to promote the improvement of Canadian Agriculture, *where it most requires improvement*. It is for the Lower Canada Agricultural Society this Journal has been published, but while acting as Editor for them, we feel any neglect or want of support to the Journal, as if we were the only party interested. We offer our most sincere acknowledgements to all the kind friends who have ever supported or encouraged our humble services, and only regret that they were not more worthy of their favour. We can, with truth, assure them that paid or unpaid, our best services have ever been rendered to Agriculturists, and what we conceived was best calculated to promote the common good of our beloved country. Countenance and support to the Journal we might reasonably expect from the educated and the wealthy, and this consciousness of favour, would, we believe, inspire us with much more happy and useful

ideas, than it is possible for us to feel under discouragement, neglect or want of support.

There is said to be a new mode of preparing flax without steeping, adopted in England, noticed in the following paragraph:—

PREPARATION OF FLAX WITHOUT STEEPING.—This simple and economical mode of preparing the fibre for the spinner is attracting important attention at this moment. The machinery employed is singularly facile and inexpensive. The flax may immediately be taken from the field, dried, and prepared; and the yield is one-third more, and the strength one-third greater, than when treated in the ordinary way. Not being tanned by steeping, it is bleached as easily as cotton; as the essential oil remaining in the fibre imparts a lustre to the flax, and preserves that “nature” which will enable the spinner to rival the finest hand-spinning, both in quality and brightness. So economical is this process, that the woody portions broken away, retaining much of the richness of the plant, are admirably adapted for feeding cattle; and thus not one single atom of this valuable produce of our soil need be lost. There is, moreover, a peculiar idiosyncrasy in flax so prepared to unite kindly with woollen or silken fabrics, imparting great strength and beauty, and considerably lessening their cost.

As far back as 1816 we recollect to have seen flax prepared without steeping, and of beautiful quality. The mode now recommended, may be different, and it would be a great advantage in the management of flax if it could be dressed without steeping in water, as it is frequently injured by this process if allowed to be too long in steep, and the length of time it should be in steep is not generally well understood. We hope to be able to give some further information on this subject soon, that may be encouragement to the cultivation of flax in Canada, which we conceive would be very desirable.

We have received, through the kindness of Sir James Ed. Alexander, from Professor Robb, President of the “New Brunswick Society for the Encouragement of Agriculture, Home Manufactures and Commerce” the first number of their *Journal*, with the *New Brunswick Almanac* for 1851, prepared under the

superintendence of the Fredericton Athenæum. We beg to return thanks to Professor Robb for these interesting works, and request he will accept the exchange of the *Journal* of the Lower Canada Agricultural Society from their commencement, which we hope Sir Jas. Ed. Alexander will be so good as to forward to Fredericton. We are authorized to state that the Lower Canada Agricultural Society will be most happy to correspond with the New Brunswick Society on any subject connected with the subject which both Societies have been organized to advance. In our next number we shall refer to these books, and copy some extracts.

AGRICULTURAL REPORT FOR OCTOBER.

This month finishes the harvest of the farmer. The crop of the year will now have been collected, and he will have some idea of the total amount of his produce, although he may not, of its actual value in our future markets. As we before observed, the result of the year, we believe, will be favourable, as regards the general produce of the crops. We do not pretend that the acreable produce will be very large of any grain, but we have no doubt it will be equal to our cultivation of the soil for the various crops. Farmers in Canada have not much idea of the great expense incurred in England in the cultivation of ordinary farms, and the amount of capital employed. The latter is generally from £6 to £10, per acre, and frequently over this last amount. The expenses per acre annually, exclusive of rent and taxes, is from £2 to £5—all sterling. We have lately seen a Report of a farm of 740 acres, situated near Brighton, England. The annual expenses, including rent, taxes, &c., are £4500—and the annual returns for the last three years, are about £9 per acre, leaving a profit for the farmer of over £2000, for interest of capital and superintendence. This is not kept as a farm to supply garden vegetables, as there is 350 acres of grain grown annually—

110 acres of peas and green crops, and the remainder of the farm is in meadow, clover, tares and pasture. The stock kept upon this farm is, 28 horses for work,—21 Milch cows—12 Heifers—about 500 South Down sheep, and some pigs. The amount paid for manure annually, is about £700, and will it be believed? the farmer has 12 ploughs, all of wood, and having two wheels each, and very much resembling the Canadian wheel plough. Such are the only ploughs in use on the farm, with only this difference—that some of them are lighter than the others. This farmer, Mr. Rigden, has two drill machines, which cost £36 each, for sowing his grain, and although he finds it advantageous to use none but wheel ploughs, he has all other implements of the very best description. He has an Iron Roller that cost £70, and will roll over 20 acres in a day, and is drawn by 6 horses. Here is a farmer with wooden wheel ploughs, whose average of wheat is 36 bushels per acre, barley 40 bushels, oats from 60 to 80 bushels, mangel wurtzel 30 tons, and potatoes, from 150 to 300 bushels per acre. We introduce an extract from the Report of this farm, that we hope may not be without its usefulness, although it may be imagined as out of place in a Canadian Agricultural Report. We would be glad to see a Report of a larger general return from a farm where only swing ploughs would be used. There is not anything better calculated for instruction than reading reports of well managed farms in the British Isles, and the report we have now referred to is made by a Scotchman (now in England,) to a Farmers' Club in Berwickshire, Scotland. We are very anxious to see the necessary improvements introduced in our system of husbandry, but we do not wish, nor is it necessary to destroy all that belongs to the present system of Agriculture in Canada to effect this improvement. The Fall, so far, has been very mild, with scarcely any frost up to this time, allowing a good opportunity to take up potatoes and other root crops, in good

condition. Potatoes are partially diseased, but we hope there has not yet been any great loss by rot. The crop is generally light, and from this circumstance, they will be more likely to escape disease. We would strongly recommend any farmer who has the means, to manure for potatoes, carrots, and parsnips now, instead of in the Spring, and for grain crops also if possible. This is a very favourable season for ploughing. It is much preferable that the land should be rather dry than over wet when ploughing. Soil ploughed in too wet a state is very much injured, and it is difficult to restore it to a proper state. Land intended for summer fallow should be ploughed this Fall. This process we shall never cease to recommend to Canadian farmers as a necessary and easy means of improving their land. During the period that the land is fallow, it would often be necessary to change the direction of the ridges, and this is the only time to do so. If the situation of the land and drainage would admit, we should always prefer to have the ridges run North and South, or as near to it as possible. We believe that land, ridged in this way, will produce more of whatever crop, than if the ridges were to run in any other direction. The furrows and drains in ploughed land should be carefully cleaned out this Fall. Every farmer will understand how much better, land can be ploughed and drained, when the ridges are straight, than when crooked, and how much better the appearance of the field. The pastures continue green and afford a full supply of food for stock. The markets are well supplied with butchers' meat and all other descriptions of Agricultural products, and the prices for all are moderate. There is a considerable quantity of Canadian made cheese of good quality in the market this Fall, and we rejoice at it. Strangers who would visit the Montreal Market of a market-day would find it a very fine Exhibition of Agricultural products, and fruit, and vegetables, not to be excelled in North America. This is the

farmer's Exhibition and one he may be proud of, notwithstanding that the general state of our Agriculture is not so advanced in improvement as it might be, or as it is desirable it should be. A well supplied market, of excellent products, will be the best and most profitable Exhibition farmers can ever have, and good prices at the market will be the best prizes they can ever obtain, and we fervently hope they will do all that is in their power to make this Exhibition better every day and every year, and we wish them God Speed with all our heart.

October 25th. 1850.

NOTICE.—The Directors of the Lower Canada Agricultural Society are requested to meet, at their Rooms, in this City, on Saturday, the 16th day of November instant, at 11 o'clock, A. M.

By order,

WM. EVANS,

Sec. L. C. A. S.

EXPERIMENTAL AGRICULTURE.

By Professor Johnston.

Purposes for which experiments are made. Object of the suggestions contained in the present work.

The ultimate aims of applied science, in its relations to agriculture, will be the more fully and speedily attained in proportion as it succeeds in converting the practical farmer into a skilful, reasoning, and cautious experimenter, and every agricultural holding into a progressing and profit-giving experimental farm.

Experiments in chemical science are made with the view either of illustrating what is known, of testing what is asserted, or of discovering what is unknown.

In the *first* case they are intended either—

1°. To exhibit the known properties and mutual relations of bodies, and their influence upon animal and vegetable life; or,

2°. To demonstrate received theoretical views in reference to these known properties and relations.

These are merely illustrative experiments, such as the chemical lecturer makes before the audience he is instructing.

In the *second* case, they are intended to try alleged facts; to test hypotheses; to determine whether observations said to have been made have been made correctly; whether conjectures

thrown out have any foundation in truth; whether theories propounded are deserving of a place in our books, or ought to be banished altogether from their pages. These researches of the experimental critic are as valuable and important as any which can be made. To them we must be indebted for clearing away much rubbish which at present finds a place in our works upon scientific and practical agriculture.

In the *third* case, they are intended to discover new properties, relations, and useful applications of bodies; to determine more accurately and more fully the circumstances by which these relations and applications are modified; and thus to help us forward to the establishment of new or more general theoretical principals, and of new practical deductions.

To these last the term *research* most strictly applies, though with a view to both the second and the third of the objects specified above, experiments in the field and the feeding-house are fitted to render much service to the arts of rural life.

In suggesting the experiments proposed in the following pages, it has been my intention, among other things,—

First, To bring into view the numerous weak, or doubtful, or altogether dark points in our present knowledge of agricultural theory; and.

Second, Critically to consider the bases on which our opinions in reference to many practical points really rest. Weak points in theory, and uncertainties in practice, ought to be fairly stated and considered. Instead of being covered over and hidden by confident assertion, they ought to be made the subject of experiment in the field or in the feeding-house, and of analytical research in the laboratory. It is to the field and feeding experiments that I intend principally to confine the attention of my readers in what is to follow, though I shall not fail to indicate from time to time those experimental researches in the laboratory which appear most urgently to be required.

Such a procedure will benefit agriculture, not merely by suggesting to individual cultivators what may prove interesting and instructive additions to the ordinary labors of the farm, but also by putting into the hands of agricultural societies—now so often at a loss for subjects of intellectual interest to which the attention of their members may be drawn, or for which premiums may be offered—an almost boundless field of inquiries, upon which their labors may, year after year be beneficially expended; inquiries, each of which will tend to awaken thought and excite discussion, while they are of a kind, also, upon which the least cunning in agriculture will not venture to cast ridicule.

Some years ago, the Highland and Agricultural Society of Scotland began to offer premiums for experiments in the field, founded on the

suggestions contained in the appendix to the first edition of my published *Lectures*.* The Royal Agricultural Society of England also took up the same subject, though less warmly than the Highland Society, and still more limited exertions in the same walk have been made by many provincial societies. These premiums caused many persons to undertake such experimental inquiries, many competitors appeared for the prizes which were offered, and a large body of valuable results has from time to time been published, especially in the *Transactions* of the Scottish Society.

But, with the award of the premiums and the publication of the results, the labors of the Societies have ended. The experiments and their results have never been criticized, compared, or digested,—their merits or defects carefully and candidly pointed out,—the purposes for which they were made, weighed against the information they yielded,—the rubbish they presented, separated from the useful matter they contained,—and the steps distinctly pointed out which ought next to be taken, in order to secure a further advance.

These things it is my wish to do to extent in the present work. The suggestion of such a union between theoretical science and field experiment, with a view to the more secure and rapid progress of agriculture, originated very much with myself; and I feel bound, in so far as my knowledge and leisure permit, to show how much we have as yet attained, how our methods of experimental procedure may be improved and made more reliable, and what new inquiries may be entered upon, in the hope of solving the numerous agricultural problems which lie still unexplained before us.

The progress of scientific agriculture cannot fail to be greatly promoted by an extension of the habit of cautious experimenting, and the multiplication of results in which confidence can be placed. But many persons, capable of benefiting the art of culture in this way, are unaware of the points which chiefly require to be investigated, and in what way the investigation is to be commenced; while others are now groping in the dark, uncertain, and therefore unsuccessful, in their experiments. Many also who have hitherto felt no interest in such pursuits, require only to have their objects clearly set before them to become warmly and zealously devoted to them. These have served as additional inducements to me in preparing the following pages.

Habits and analogies of the species of plants on which experiments are made, and of their general varieties.

But a knowledge of the special habits and analogies of particular species of plants, and of their several varieties—the soils on which

they grow—the diseases to which they are subject—the enemies, animal and vegetable, by which they are liable to be attacked,—these things are not less important to the suggester of experiments than a knowledge of their general physiological and chemical functions.

Chemistry, from the mouths of some of its more hasty or more ardent cultivators, has promised to make any plant grow luxuriantly, and at will, upon any soil, provided only that it be suited to the prevailing climate. But such promises are mere idle boasting, and argue much ignorance on the part of those who venture to make them. Even chemistry, with all her power, must bend to the constitution and natural habits of a plant. Thus—

1°. *The oat* and red clover love a firm and stiff soil—a natural habit, which chemistry cannot hope to change. On some soils the Tartary oat yields heavy crops, while, on the same soil, the more valuable Potato oat refuses a remunerative return. Where other varieties of oats grow sound, the Hopeton oat is subject to a disease called sedge or tulip root, which is gradually driving it out of cultivation. I do not know whether these qualities of the Potato and Hopeton oats be within the dominion of mechanical or of chemical causes.

2°. *Wheat*.—Winter wheat fails in many places where Spring wheat is found to do well. Such a result has been observed in the island of Islay, where so many improvements have in late years been made by Mr. Campbell of Islay. Is chemistry or climate, or the special constitution of the variety of wheat, or the mechanical condition of the soil, to blame for this?—and which of these causes has most to do with the capability of this or that field to grow white or red wheat, or with the greater productiveness of this than that variety of seed on similar soils?

3°. *Barley* affects a lighter soil, but the quality of the grain varies with the natural dryness, the drainage, or the quality of the land; and the maltster, the feeder, or the pot-barley maker, buy it accordingly. Yet, in regard to the physical condition of the soil, different varieties have different tendencies. The Chevalier barley grows on clays on which the Annat—one of our best varieties—does not succeed; and this is probably one reason why the Chevalier barley has spread so widely, and yields good crops even on the Huntingdon clays. Some varieties show a great difference as to the physical nature or condition of the soil, while others are most choice in their selection of a suitable soil. Thus the Annat variety, already mentioned, not only dislikes a clay, but a gravelly soil also, and thrives best on a dark-coloured loam.

4°. *Rice* grows usually on low alluvial flooded tracts of land, and abundance of water at the earlier stages of its existence are in most cases

a necessary of life to this plant. But there are varieties of hill rice which grow healthily, and ripen on dry land. This difference, though a little more striking, is, in reality, not more remarkable or deserving of attention than the constitutional differences above mentioned in regard to barley.

5°. *The Turnip*.—The numerous varieties of turnip so generally known in this country, differ little less in habit, and tendency, and choice of soil, and power of resisting the effects of climate than varieties of grain do. It is essentially favoured by a cold and humid climate. Hence it is a less profitable culture in our southern countries, and yields less abundant crops along our eastern borders. The yellow and the white varieties differ greatly in nutritive value and in climatic habits. Of white turnips, again, varieties differ. Thus the *white stone* comes quicker to maturity than the *white globe*; so that what is fitted to nourish and bring forward the one will not promote the growth of the other in an equal degree, or cause it in the same month of the year to yield an equal crop. In different districts, also, and under different treatment, the same variety is differently nutritive—a circumstance of much importance in all experiments on feeding.

The turnip is also liable to special attacks from insects, and to special diseases—such as that called fingers-and-toes—accidents which are more or less completely beyond the calculations of pure or theoretical chemistry.

6°. As the cultivated carrot is the off-spring of the wild carrot, (*daucus carota*), so the white beet (*beta vulgaris campestris alba*) are allied to the sea-side beet, (*beta maritima*), which, like them, has a fleshy root, and is good for food. This analogy indicates the probable wants of the beet tribe, the probable utility of saline applications to the plant while growing, and the especial expediency of making experiments upon it with that common salt for which the *Beta maritima* frequents the sea-shore.

The farmers of the Guildford Club, (Surrey,) in a recent discussion on the growth of beet, came to an unanimous resolution that, in their soils, experience had shown common salt to be a valuable promoter of the growth of this root, and that it was worthy of being recommended.

The analogy above stated throws light on this result of practical experience, and points out to the improving experimenter the special value to him of a familiarity with such analogies: they not only modify and restrain the conclusions to which pure chemistry might erroneously lead him, but they indicate new paths of inquiry on which his chemical knowledge may exercise itself to the manifest advantage of scientific agriculture.

7°. *The pea* exhibits, among its several varieties, similar liabilities to be attacked by insects

as the turnip does, and which, as in the case of the turnip, do not admit of easy or satisfactory explanation.

I lately saw on the home farm of Lord St. John, at Melshburne, in Huntingdon, a field of winter peas, sown in November 1848, which had been all treated and manured alike, but on one half of which the seed sown was the early maple—a common field pea; on the other half the Ringwood marrow dwarf—a white pea. The latter was attacked at Christmas by the slugs, and in great part devoured so as to require filling up with fresh seed, while the former—the gray pea—was untouched by them. There may have been some other reason besides the difference of variety for this limited attack of the slug; but it is obvious that circumstances or liabilities of this kind may materially modify the effect of chemical applications made to our crops, and may be the often unsuspected cause of important discordancies in our results.

I might give many other illustrations of the general habits and analogies of our commonly cultivated crops, and quote many special physiological facts, such as that dry weather makes roots like mangel-wurtzel run prematurely to seed, and that the seed so prematurely formed produces plants which, under any circumstance of weather, exhibit a similar tendency, (Stephens;) that, to succeed equally, some seeds, like that of the parsnip, must be sown new or fresh, (Le Couteur,) while others will germinate readily and healthily though kept for years, and so on; but the examples already given are sufficient to show that much other knowledge besides what is purely chemical is necessary to the suggester of agricultural experiments even of a chemical nature. His skill in regard to the circumstances in which they are likely to succeed, and therefore ought to be tried, and, above all, his ability to account for failures and discordant results, will in a great measure depend upon the possession of this practical physiological knowledge.

8°. So in experiments upon trees, no less than upon field crops, practical knowledge of a similar kind is most necessary. That the clays of the gault and weald favour the oak; that the elm flourishes only on the soils of the intermediate more sandy strata; that our cider countries rest chiefly on the old red marls, those of France on the chalks of Normandy, and the tertiary or more recent drifts which overlie them; that, in Betmuda, the coffee-tree grows luxuriantly on the recent hard calcareous rock of that island: such facts as these, with which the practical man is usually most familiar, are all of much use to the experimental adviser, and are rich in suggestions as to the kind of experiments which are likely to succeed upon each species, as to the method of making them, and as to the kind of soils on which good results are to be expected.

RULES

OF

THE LEGISLATIVE ASSEMBLY,
RESPECTING PRIVATE BILLS.

ADOPTEd on 3rd August, 1850, and substituted for the Rules (numbered 60 to 72) heretofore in force.

60. That hereafter no Petition for any Private or local Bill will be received by the House, after the first fifteen days of each Session, unless the Petitioners shall have first applied, after notice thereof, for leave to present such Petition, and obtained permission of the House to do so.

61. That hereafter this House will not receive any Private or local Bills, except within the first four weeks each Session.

62. That this House will not receive any Report of a Standing or Special Committee, upon any Private or local Bill, except within the first six weeks of each Session.

63. That the Clerk of this House shall, immediately after the issuing of the Proclamation convoking the Provincial Parliament for the despatch of business, announce, in the Canada Gazette, and other newspapers published in this Province, until the opening of Parliament, the day on which the time limited for receiving Petitions for Private Bills will expire, according to the Rules of this House; and the said Clerk shall also announce, by notice set up in the Special Committee Rooms, and in the Lobby of this House, by the first day of every Session, the days on which, according to the Rules of this House, the time for receiving Petitions for Private Bills, Reports on those Petitions, and Reports on the Bills upon those Petitions, are to expire.

64. That all applications for Private or local Bills, whether for the erection of a Bridge, the making of a Rail Road, Turnpike Road, or Telegraph Line; the construction or improvement of a Harbour, Canal, Lock, Dam, or Slide, or other like work; the construction of works for supplying gas or water; or for the incorporation of any particular Profession or Trade, or of any Banking or other Commercial Company, or Cemetery Company; the incorporation of a Town or City; the levying of any local Assessment; the division of any County or Township; the regulation of a Common; the re-survey of any Township, Line, or Concession; or for granting to any individual or individuals any exclusive rights or privileges whatsoever, or for doing any matter or thing which in its operation would affect the rights or property of other parties; or for making any amendment of a like nature to any former Act, shall require the following notice to be published, viz.:

In *Upper Canada*—A notice inserted in one newspaper published in the County, or Union of Counties, affected.

In *Lower Canada*—A notice inserted in one newspaper in the English, and one newspaper in the French language, in the District affected (if any be published therein), and also affixed at the Church door of every Parish or Township that such application may affect, or in the most public place where there is no Church.

Such notices shall be continued in each case for a

period of at least two months, during the interval of time between the close of the next preceding Session, and the presentation of the Petition.

65. That before any Petition praying for leave to bring in a Private Bill for the erection of a Toll Bridge is presented to this House, the person or persons purposing to petition for such Bill shall, upon giving the notice prescribed by the 64th Rule, also, at the same time, and in the same manner, give a notice in writing, stating the rates which they intend to ask, the extent of the privilege, the height of the arches, the interval between the abutments or piers for the passage of rafts and vessels, and mentioning also whether they propose to erect a draw-bridge or not, and the dimensions of such draw-bridge.

66. That parties publishing notices of intended application for Private Bills under the 64th Rule, shall be required to send, addressed to "Private Bill Office, Legislative Assembly," (as soon as may be after its publication) a copy of the local newspaper containing the first insertion of any such notice (or a certificate of the insertion thereof, by the proprietor of such paper); and also, after the presentation of the Petition, a copy of the paper containing the last insertion of the said notice (or a certificate thereof), together with proof of notices having been affixed (when required) at the Church doors.

67. That every Private Bill shall be prepared by the parties applying for the same, and printed by the contractor for the Sessional Printing of the House, at the expense of the said parties, and one hundred and fifty copies thereof shall be deposited in the Private Bill Office, for the use of Members, before the second reading.

68. That Bills of a private nature shall be introduced on a Petition, to be presented by a Member, and seconded.

69. That when any Bill shall be brought into the House for confirming Letters Patent, a true copy of such Letters Patent shall be attached to the Bill.

70. That the expenses and costs attending on Private Bills giving any exclusive privilege or advantage, whether for the erection of a Bridge, or the construction of a Railroad, Turnpike Road, Telegraph Line, Harbour, Canal, Lock, Slide, Dam, or other like work; or for the incorporation of Banking or Commercial Companies, Cemetery Companies, or Companies for the construction of Gas or Water Works, or for any other objects or profit; or for amending, extending, or enlarging any former Acts in such manner as to confer additional powers, ought not to fall on the public, and that for the purpose of defraying the same, the parties seeking to obtain any such Bill shall be required to pay into the hands of the Clerk of this House the sum of fifteen pounds, before, in any case, the said Bill shall be further proceeded upon after being read a second time.

71. That every Private Bill, after having been read a second time, shall be referred to the Standing Committee on Private Bills, if any such shall have been appointed, or to some other Standing Committee of the same character.

72. That whenever any Petition or Bill presented to the House shall have been referred to a Committee to examine the matter thereof, and report the same as it shall appear to them, to the House, the House will not admit any Petitioners to be heard, by

themselves or Counsel, against such Petition or Bill, until the matter shall have been first reported to the House.

73. That all persons whose interest or property may be affected by any Private Bill shall, when required by the Committee, appear in person before them to give their consent, and if they cannot personally appear, they may send their consent in writing, which shall be proved before the Committee by one or more witnesses. And in every case the Committee upon any Bill for incorporating a Company, shall require proof that the persons whose names appear in the Bill as composing the said Company, are of full age, and that they are in a position to effect the objects contemplated by the Bill, and have personally consented to become so incorporated.

74. That no Committee on any Private Bill, based upon a Petition, notice of which is required by the 64th Rule, shall sit thereupon, without first causing a week's notice of the day of sitting to be set up in the Lobby.

75. That the Committee to whom any Private Bill shall have been referred, shall report the Bill to the House, whether such Committee shall or shall not have agreed to the Preamble, or gone through the several clauses, or any of them, and when any alteration shall have been made in the Preamble of the Bill, such alteration, together with the ground of making the same, shall be specially stated in the Report.

79. That when the Committee on any Private Bill shall report to the House that the Preamble of such Bill has not been proved to their satisfaction, they shall also state the grounds upon which they have arrived at such a decision.

77. That a filled up Bill containing the amendments proposed to be submitted to the Committee on the Bill, be deposited in the Private Bill Office, one clear day before the meeting of the Committee upon such Bill.

78. That the Chairman of the Committee shall sign, with his name at length, a printed copy of the Bill, on which the amendments are fairly written, and shall also sign with the initials* of his name, the several amendments made and clauses added in Committee.

79. That no Private Bill be read a third time, until the party interested shall have delivered to the Clerk a certificate from the Queen's Printer, that the cost of printing one hundred and fifty copies of the Act for the Government, has been paid, or secured to him.

80. That (except in cases of urgent and pressing necessity,) no motion shall be made to dispense with any Sessional or Standing Order of the House, relative to Private Bills, without due notice thereof.

81. That a Book, to be called the "Private Bill Register," shall be kept in a room to be called the "Private Bill Office," in which Book shall be entered, by the Clerk appointed for the business of that Office, the name, description and place of residence, of the parties applying for the Bill, or their agent, and all the proceedings thereon, from the Petition to the passing of the Bill; such entry to specify briefly each proceeding in the House, or in any Committee to which the Bill or Petition may be referred, the day on which the Committee is appointed to sit, and the name of the Committee Clerk. Such Book to

be open to the public inspection daily, during Office hours.

81. That the Clerk of the Private Bill Office do prepare, daily, lists of all Private Bills, and Petitions for Private Bills, upon which any Committee is appointed to sit, specifying the time of meeting, and the room where the Committee shall sit; and the same shall be hung up in the Lobby.

MATTHEW MOODY,

MANUFACTURER OF

THRASHING MACHINES, REAPING MACHINES, STUMP AND STONE EXTRACTORS, ROOT CUTTERS, REVOLVING AND CAST-STEEL HORSE RAKES, PATENT CHURNS, WAGGONS, &c. &c. &c.

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GREAT AGRICULTURAL WORK!

THE FARMER'S GUIDE.

TO

Scientific and Practical Agriculture.

BY HENRY STEPHENS, F. R. S. E.,

Author of the "Book of the Farm," Editor of the "Quarterly Journal of Agriculture." &c. &c.,

ASSISTED BY JOHN P. NORTON, A. M.,

Professor of Scientific Agriculture in Yale College, New Haven, Author of Agricultural Prize Essays &c., &c.

THIS highly valuable work will comprise two large royal octavo volumes, containing over 1400 pages with 18 or 20 splendid steel engravings and more than 600 engravings on wood, in the highest style of the art, illustrating almost every implement of husbandry now in use by the best farmers, the best methods of ploughing, planting, haying, harvesting, &c. &c., the various domestic animals in their highest perfection; in short, the *pictorial* feature of the book is unique, and will render it of incalculable value to the student of agriculture.

This great work is the joint production of two of the most talented agricultural scholars of the day; the one eminent as an author and editor in Great Britain, and the other as a Professor in Yale College. Both are eminently practical as well as scientific men, and all they say may be relied on as the result of profound research, tested and sustained by practical experiment. The contributions of Professor Norton are chiefly designed to adapt the British portion of the book to this country, and thus to make it an Anglo-American work, giving to its readers all the really useful agricultural knowledge at present attainable in either country.

The work is divided into four departments, distinguished by the four seasons of the year, commencing with Winter, and Prof. Norton's notes, will be published as an appendix to each part. The first chapter treats of the following subjects, under the head of

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- On the Difficulties to be encountered in learning Practical Husbandry, and on the Means of overcoming them.
- On the Different kinds of Farming.
- On the persons required to Conduct and Execute the Labor of the Farm.
- On the Branches of Science most applicable to Agriculture.
- On the Institutions of Education best suited to Agricultural Science.
- On the Evils attending the neglect of Landowners and others to learn practical Agriculture.
- On observing the details and recording the facts of Farming by the Agricultural Student.

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AGRICULTURAL JOURNAL, AND TRANSACTIONS

OF THE

Lower Canada Agricultural Society.

VOL. 9.

MONTREAL, DECEMBER, 1880.

NO. 12.

With great pleasure, we give insertion to the communication of "A Ploughman," and we readily admit it to be the best written letter we have seen with this signature. We perfectly agree with our correspondent, except on two points, that is, the size of the furrow slice, and allowing a ploughman competitor at a Ploughing Match, *to leave his plough*, and arrange with his hands and feet, defects in his ploughing. We have no objection to offering advice to the ploughman, as to his work, when he comes to the head-land; although, such advice, unless coming from his employers, might not in all cases be judicious, and possibly would confuse the man. We agree with our correspondent, that establishing a scale is not of so much consequence, provided the furrow slice shall not be cut at a *less depth* than 5 inches, or a *greater width* than 8 inches, for this depth, but we do not think that a furrow slice of 6 inches deep and $7\frac{1}{2}$ inches wide, will make the best seed bed, or handsomest ploughing. We conceive that when the slice is cut off this size, it must necessarily stand too much upon the edge, and will allow the seed, when sowing, to go down between the slices, and hence, be buried too deeply. We should prefer that one slice lapped over the other, the one-third of its width, or about 3 inches at least, when ploughing grass-land. Doubtless the more minute the division of the soil, by the action of ploughing, the better, provided the furrow slice lies properly, and so as to check the growth of grass—but when the depth and width of the slice are

not in proportion, we have never, in our experience, found the ploughing to come up to our humble ideas of perfection. Of course, we only refer to ploughing swarth, or grass land, not to fallows, or land that has been in tillage the year previous. When ploughmen are allowed to quit their plough, and delay their time, (as they did at the last County of Montreal Ploughing Match,) in settling the furrow slice, they can never accomplish their work in the space of time, that would entitle them to receive a prize. But, independent of this, we humbly conceive the practice to be very objectionable, where men come forward as practiced ploughmen, and where the land is generally selected as the most easy to plough in the country, as it was at Mrs. Mills' farm. We offer these objections to the communication of our correspondent, whom we have not the pleasure of knowing, with the greatest deference because from the manner he writes, we are satisfied he must understand his subject better than we can pretend to do—and we can assure him it affords us much satisfaction that his general views on this subject, are so much in accordance with our own. May we hope that as he can write so well, and to the purpose, that he will often favor us on any agricultural subject. If we should at any time differ from him, we shall certainly state upon what grounds and in the least offensive manner possible. We give our correspondent credit for being a gentleman as well as "A Ploughman," and shall treat him as such, should he favor us again.

TO THE EDITOR OF THE AGRICULTURAL JOURNAL.

SIR,—Being a regular reader of your Journal, a few thoughts have been suggested by the perusal of your last number, especially from the letter of a *Young Ploughman* and the answer you gave him. The following remarks I wish you to give publicity to in your next number, that they may have a chance to effect some little improvement in certain quarters—if they are sound. And as *a* and *all enquiring young ploughmen* are to me interesting, allow me to answer his questions in my own way.

And FIRST. If the judges at matches be judges of ploughing it matters little whether there be scales given or not, for the ploughman who takes unsuitable proportions of a furrow, will cure himself of that, when he sees the decisions of merit given, as the most desirable style of ploughing may be learned from the successful lots. But the scale that I would have a young ploughman to aim at as a standard, is 6 inches deep by $7\frac{1}{2}$ wide: such a furrow is the most desirable and most perfect, and can be attained by means. Any other proportions will not satisfy an experienced eye, nor accomplish the requisites and effects of good ploughing, and he that possesses the knowledge to trim a plough to work a furrow of these dimensions as it should be wrought, may flatter himself of having acquired the greatest possible proficiency in ploughing so far as trimming of ploughs is concerned.

And SECOND. As to TIME, it is the most requisite condition that can be enjoined upon competitors. Where I came from, in Scotland, each lot was previously measured, and on the ticket of the lot was written the number of roods, falls and yards the lot contained, and the hours, minutes and seconds it was to be finished at.

Except at beginning and finishing, setting poles at *firing*, and leading one horse before another at *hinting*, no person was allowed to set a foot upon the land during its being ploughed, to aid the ploughman in any shape whatever, except at the head ridges or land-ends, where all had access to and where all or any interested parties might aid or instruct their *man* as in turning the horses and plough, while the ploughman took a peep along his work to detect flaws, and remedy them next *bout*, or give instructions

to him from any part of the field unoccupied by ploughs. But no person was allowed to set a foot upon the competing land except the competitors and judges, till the judges came off it, when all were allowed to cross it and examine and criticise as they pleased. The ploughmen were at liberty to use all the means in their power to make their ploughing as good as they possibly could, using hands and feet and all till their *time was up*, which they would do sometimes with watch in hand till the last second of their time, and if hurried, run across to a neighbour's lot rather than risk being scored out by running down to the land-end on his own lot. "Time," I overheard an old farmer on one occasion remark, at seeing the panic of some fearing they would be too late, "tries their mettle, at home, they may *stand* and plough, but here, they must *go* and plough." Time is the best subordinate safeguard to fair play, without restrictions to the less spirited and ingenuous will use it and abuse it for his own interest, as the difference of twenty minutes more taken by one than another, in a given extent of ground, may turn the prize otherwise than it would, had *time* been exacted.

Of course, lots cannot always be had alike in extent, and therefore all cannot be expected to finish at the same time, but for the falls and yards, let the time be calculated at the *given time per acre* for the entire lot. Circumstances may sometimes render exceptions expedient; but the rule should be, *in time or no prize*.

As some of your readers may not be aware of the strictness to which this point is carried in some places, I copy from a letter which I received from Scotland some months since, a remark or two on this point, showing as it does, how much order and fair play are appreciated. He says: "Your friend P. got a good lying lot but the leafield being above 30 years old, was so tough in the sward, that when the plough went fast through it, it would scarcely turn at all; and so tough was it that, if you had commenced tumbling back a furrow at one end of the field, it would have run to the other in a whole furrow. He had a pair of good horses, but they and him were nearly by with it. Many of them were best off without finishing their lots, and all of them were as well tired as ever they had been. Many *were out of time*, and even some who got prizes were as much as 20 minutes late; but

from the causes referred to, the work was generally inferior to previous matches, and therefore time-keepers and interested parties were less on the look-out than they sometimes are; and not easy to tell where many prizes would be, hence chances were got, but it was easy to see that P. was about first, and which, by the evidence of a large group on his land-end, made his time widely known, and that his time was *up* before he finished.

A meeting of Committee was held, and notwithstanding the untoward circumstances, it was decided, that he got nothing, *being out of time*."

Rules should be binding, and those who infringe them should forfeit all claims, though deserving otherwise. But it is hard to bring ardent competitors or interested on-lookers to avoid doing so, especially when changes, unreasonable and different from long established practice are resorted to. Arising from such innovations, squabbles and ill-feelings may be expected to occur yearly, as at the late Montreal Match, where regard to the regulations was partially exercised and not acted out in every instance, which if they had been so, it is asserted by some parties that more prizes than that of the Senior Canadians would have changed places. But it is hard to know where each prize would have been, if the truth were told in this respect. But it appears to me that some of the rules are illiberal and unreasonable, and entirely inconsistent with the objects which such competitions are, in their truest sense, designed to effect. Is not the competition in ploughing for the improvement of that art chiefly, and through it indirectly agriculture generally? That all the regulations are not subordinate to the chief object, it is not hard to perceive, and look liker being framed from sinister motives and a spirit of strife. Let us look at one or two. "No ploughman shall be allowed to mend or arrange his land with his hands but may stop his horses—keeping his hands on the stilts, however—and make as long a leg as he chooses to tramp it behind him: and further, that no person shall be allowed to aid or instruct, in any shape, the ploughman after begun." These rules were made, I believe, from some of the crack ploughmen, having, last year, arranged the whole length of a furrow with their hands, and from

having the work as well as possible. Now, while I don't like to see any ploughman—from any cause, such as a bad plough or obstructions of any kind—in the unavoidable predicament of being obliged, for the sake of his work and in justice to the proprietor of the land, to lift and arrange bad places in his lot, on the one hand, and *disallowed* by a whim of a majority (who probably know little of such matters practically, and overlook common sense and justice through spleen) from making by all the means in his power, as good a day's work as he can; I say, in every respect, it is better to allow the ploughmen all the means they possess of making good work, but restrict them *to time*, and if the fault of recourse to dressing it with hands and feet (which is no fault at all but laudable when needed) lies in his want of skill in holding or in trimming of his plough to work it *herself*, where there is no obstructions, *the time* which will always sound in his ears while mending his land, will be the best incentive to improve himself in every possible way: for the look of a professedly and expected extra superfine day's job; for the discountenancing of a pernicious habit, now exploded and obsolete, of leaving one bad spot to be covered or arranged *afterwards*; and in justice to the proprietor of the grounds; allow, encourage and enforce each and all of the ploughmen to pass none of the work *unclosed*, and he will resort to all possible means to obviate the necessity of touching it with anything but his favourite implement, especially if *time* hants or rather *hunts* him. It is said, "alike for one alike for all," but except the circumstances are the same throughout, the binding of all to one certain rule, is not *individual justice*. Lots are not all alike. One there is a road in, it is worst to close, but notwithstanding, were it allowed that hands and feet be used (in short a little harder work for it just to come this when there is *time*) its possessor might rival or beat his more fortunate neighbour and competitor. One lot there is not a stone in, and the plough, if in good trim, will preserve a steady onward motion and leave masterly work, *if well* held. While a plough as good and as well manned, in a stonier lot, cannot make the same work with the same ease: in justice this ploughman must have fair play with his more fortunate neighbour, and if among these untoward

circumstances, he can by any means beat his fellow, let him by all means have a hope to sweeten his labours and pains taking, that *merit within time*, by whatever means, shall be rewarded; or at least, merit, by whatever reasonable means, shall not be disqualified. As to the latter part of the clause, viz :

That no person shall be allowed to instruct or in any way aid the ploughmen—look at the rationality and consistency of it with the designs of the Society.

On-lookers can see flaws which the ploughman cannot always timeously see, and is it contrary to the best interest of any individual connected with the ploughing—especially with a view to adhere to the true spirit of the Society for Diffusing Agricultural Knowledge and Skill, without stereotyping its influences by pernicious rules subversive of its object—to allow any to give a useful hint or word, which may be useful to any hearing or observing it. A young ploughman may be at the side of the person giving the instructions, he may see and profit by what he hears. Everything but a spirit of selfishness makes it proper to “do good to yourself and others;” but is the Society to limit the collision of opinion and exchange of thoughts necessary to improvement, which is professedly the object of all such gatherings, in the greatest possible manner, through selfish whims?

Let any friend or person of skill give a useful word to any ploughman *openly* if he will without dread of being collared by any officials on the ground. Instructions can be given when parties will it, in defiance of all species of watching offenders. But let the Committee be disinterested and encourage by a vote of thanks rather than disqualify, any who has the liberality to give advice and any who thankfully accept it. Encourage the patriotism and disinterestedness of any who will proclaim secrets worth knowing and advantageous in their application to all, by a premium if you will, but hinder not and oust not any in his zeal for proficiency. The field is the best lecture room, and let each be a teacher if he will and the benefits will be mutual. Some find fault with the judges being present on the day of the match as by being there they may be biassed in some degree, almost insensibly, to some one independent of his ploughing qualifications. A judge may think

“there’s a neighbour of mine a good ploughman at home and he’s good to-day, what do you think of this man, he’ll be in the books.” Here’s another one that I knew long ago he’s a fine fellow, he’s done me a *gude* turn afore noo, he’s ploughing well too, &c.,” &c. Such is a specimen of the objections on this point and sometimes these may happen in some degree unintentionally; for I would be hard to be made believe, that any one would go to act as judge without the desire of having for his motto, “Let the best win.” Of course having the judges to examine and decide on the day after, would obviate these objections, but then by such, that interchange of opinion, which is the chief object of improvement would be lost, and spectators would have no opportunity of examining the decision of the judges.

Just as at a Cattle Show, many learn points from the decisions which had they only seen the cattle without the decisions *before them*, would have awarded the premiums differently.

To learn judgment in such matters is the object of such meetings at all. Therefore, the greatest possible publicity and openness should be given, as public opinion also is the best subordinate safeguard to fair play or justice being exercised.

I have been intentionally diffuse in this communication, which may in some degree apologize for its length for your columns, but if any steps through it be taken towards amendment in the subject, the loss will be compensated.

A PLOUGHMAN.

EXTRACT FROM THOMSON’S LECTURES. ON BOTANY, ON SOILS, MANURES, &c.

It is a wise provision of nature, that as plants are not endued with volition and locomotion, nor guided by instinct nor reason, they are subject to more regular and unalterable laws than the animal creation, at least than that portion of it which possesses those functions which have been enumerated. Their food is always placed within their reach and they enjoy good health, and arrive at perfection in their growth, independent of external accidents, to which animals are equally liable, when they are situated where the soil contains those principles which are best adapted for the various purposes of their economy. The consideration of this question suggests the questions—What is the composition of soils? What part of soils are taken up as food by the roots of plants? To answer them has long em-

played the attention of the philosophical observer, and many and various opinions have been given to the public; but it is only since modern chemistry made those discoveries which may justly be regarded as the most splendid triumphs of experimental science, that any thing rational and satisfactory has been advanced.

The fact cannot be too often repeated and impressed on your minds, that plants are living beings, possessed of powers which enable them to convert into their own material substance, matters of a nature apparently very different from it, without keeping this in view, we should be forced to look for all the different productions of plants ready formed in the soil where they grow, and to suppose that these are simply taken up by their roots, and deposited in the different parts of the plant; an idea too incongruous to be admitted. On the contrary, they do not even take up those principles which are most abundant in the soil where they grow; but select particular parts of them, although these are not found, in general, forming in their uncombined state any part of the vegetable frame.

The ultimate components of all the various substances produced by vegetables have been found the same, differing only in the quantity and the mode of their combination; and the parts of the soil which supply these have been found to be much fewer than was previously supposed.

Every soil fit for yielding nutriment to vegetables may be supposed to consist of earth, water, air, a small proportion of metallic oxyds, and decomposed vegetable and animal matters, in which are included salts, gases, and vegetable extracts.

Earth which is the essential basis of all soils, is, as it is commonly spoken of, a compound of different earths: the most general of which are *Calcareous earth*, *Argillaceous earth*, *Silicious earth*, *Magnesian earth*, and *Ferruginous earth*.

1. **CALCAREOUS EARTH** comprehends lime usually combined with carbonic acid, in a state of limestone, chalk, shells and marl, which is a mixture of carbonate of lime with clayey and sandy matters; but lime is sometimes, also found in combination with sulphuric acid, forming a substance called gypsum; and more rarely with phosphoric acid. When too much calcareous matter is contained in a soil, it is unfertile, owing to its absorbing moisture, and consequently remaining too dry. But the case is different when the calcareous matter is mixed with silica, for then the moisture absorbed remains in a free state, and not so united with the chalky matter as to disappear and be useless to plants. But the absorbing properties of all calcareous soils are not alike; and a great difference depends on the degree of combination of the calcareous matter. Thus 100 parts of calcareous sand retain, according to Professor Schubler's

experiments, 20 parts only of water, whilst 100 parts of the same matter in the state of fine powder retains 85 per cent. In the first case, when calcareous earth and silica predominate in an arable field, they produce a hot and dry soil.

ARGILLACEOUS EARTH, comprehends clay which is generally mixed with silicious sand and mineral substances, and is very retentive of moisture.

3. **SILICIOUS EARTH** is almost entirely composed of sand. The water passes so readily through it, that very little is retained for the purposes of vegetation; and soils which contain much of this earth are, therefore barren and unprofitable. In the form of sand it retains 25 per cent. only of water, while 100 parts of it, as it occurs with clay in an arable field, retains 280 per cent. of water.

4. **MAGNESIAN EARTH** is not so commonly found as the earths we have already noticed. The magnesia it contains is combined with carbonic acid, and mixed with silicious particles. It approaches nearest to the nature of clayed earths in its power of retaining moisture; that power enabling it to retain $4\frac{1}{2}$ times its own weight of water. This renders it, when it predominates, very prejudicial to vegetation; while it increases, when added in moderate proportions, the fertility of a dry sandy soil.

FERRUGINOUS EARTH consists of those oxyds of iron, known by the names of ochres and pyrites, mixed with silicious matter. These oxyds, in particular the pyrites, when in considerable quantity in a soil, if it contains little calcareous matter, are extremely injurious to vegetation.

The pyrites is a compound of sulphur and iron, and is converted by exposure to air and moisture into sulphate of iron, which destroys plants by over-stimulating them.

Vegetable earths have the least specific gravity, and sandy soils the greatest, whether they be dry or moist; the vegetable earths contain, besides vegetables in a state of decay, animal matter and a large proportion of salts, which are chiefly common salt, sulphates of magnesia and of potash, nitrates of lime, and carbonates of potash and of soda.

Such are the earths generally contained in soils; when any one of them abounds, the compound earth is named after the component; as for instance, a calcareous soil, an argillaceous soil, &c.

The principal difference which characterises the various kinds of earths, is their power of retaining the next component of soils, **WATER**. Water, as forming a part of soils is either chemically combined with the earth, or merely mechanically mixed with it, and retained in combination by cohesive attraction. In the former, it is of no use to vegetables; in the latter, it is essentially necessary for their support. If the soil be not sufficiently retentive, the plant is starved for nothing can be taken up from the

earth that is insoluble; and as we shall show afterwards, water itself is a principal part of the food of plants. If the soil be too stiff and retentive, the water remains upon its surface, and does not percolate to a sufficient depth to be applied to the roots; and if the vegetable be of a succulent kind, the herbaceous part remaining constantly surrounded with moisture has its vegetative powers weakened, and rots. This is particularly the case in winter; for, as the vital energy of the plant is then much lowered by cold, a disease of the vegetable takes place, similar to what happens in a leucophlegmatic state of the animal body, from which the plant rarely recovers. The most efficient soil, as far as winter is concerned, is that which contains a due mixture of carbonate of lime, sand and pulverised clay, with some vegetable or animal matters; and in which the materials are so mingled as to remain loose and permeable to the air. This is calculated not only to retain the water in proper quantity; but also to absorb it from the atmosphere, which is one great source of the supply that vegetables require; for water, as has been already remarked, is requisite for rendering the other matters in soils sufficiently soluble to be taken up by the roots of plants.

All the earths are more or less soluble in water; thus lime is taken up readily in its pure state; and also if the water contains much carbonic acid in solution, when the lime is in the form of chalk, or a carbonate, in the proportion of about 1-680 part of its weight. Clay is soluble in a minute proportion in rain water; silica even may be retained in solution by the aid of carbonate of potash; and in the minute state of division in which it is precipitated from an alkaline solution, it is soluble in 1000 parts of water; 200 parts of pure water hold one of magnesia in solution.

Air is, also, a necessary component of soils. Atmospheric air is absolutely necessary, as we know, for carrying on the process of germination; the more pulverulent, therefore the soil is, the more air it is capable of containing, and consequently is the better adapted for supporting vegetation. But a soil which is too sandy, the water not being retained, although it appears to be loose, yet does not contain so much air enveloped in it as it required; for the small particles of which it is composed apply more closely to each other, and lie in a smaller compass than the aggregated masses of a better soil, which touch at a few points only, and, therefore, have more and larger interstices between them. When the soil is too retentive, the water which remains on its surface evaporates in summer, and deposits the clayed particles which it had suspended, a kind of paste is left, which hardening, by being baked, as it were, in the heat of the sun, no air can penetrate to the parts beneath it; nor can that which has been already used in the vegetative process, and which is

unfit to carry it further on, escape; and we know that as atmospheric air is vitiated by the roots of growing plants, and during the germination of seeds, a constant renewal of it is requisite for supporting the vigour of vegetables. It is the oxygenous portion of the atmospherical air contained in the soil which is vitiated by the functions of the roots of plants.

* * * The last component of soils which we have to mention, has always been regarded as the most important of the whole. We allude to animal and vegetable matter in a state of decomposition, from which the black mould which constitutes the richness of soils is almost altogether formed. But the analysis of some of the most fertile soils has proved, that their fertility does not depend on the presence of a large proportion of those substances. Thus Sir H. Davy found that the soil of a very fertile field in East Lothian, contained nine parts only in the hundred of decomposed animal and vegetable matter; and a soil from the low parts of Somersetshire, long celebrated for yielding crops of wheat and beans without manure, contained five parts of these principles only in the hundred. It is indeed, true that the carbonaceous matter contained in plants can be derived most easily from decomposing animal and vegetable substances; but these also yield salts, which prove highly stimulating to growing plants; and although plants seem to attain great bulk and vigour when much manure is applied, yet they are over stimulated, and their growth is connected with disease, in the same manner as in an overfed and pampered animal. The natural state of both is altered; premature age succeeds and death arrives long before the period when he should be naturally expected. Those plants, also, which are intended for food for man and animals, when reared upon soil of the kind we are now noticing, yield less nutriment in the same bulk, than that which more healthy plants yield; and it is also of an unwholesome kind. Upon the whole, we may truly assert, that more harm is done by loading soils artificially with much animal and vegetable matter, than the natural deficiency of it in soils can occasion.

When a Botanist examines a space of ground, he forms an estimate of the nature of the soil, by observing the kind of plants, or weeds, as they are termed, which it naturally produces, and draws his conclusions from the knowledge he possesses of the relation which always subsists between the plant and the soil. If the plants are those which have divided roots, he concludes that the soil is pulverulent and easily penetrated; but if the roots are thick and fleshy, that as they require a humid soil, it is probable that it is damp and retentive. Some kinds of plants grow on one soil, but are never found on another; some require a large supply of carbonaceous matter, or a rich fertile soil; others, he knows, glean the little they require in the

most barren, and soon die in richer spots. But the knowledge of the Botanist although it is an accurate guide to a certain degree, in directing his judgment to the value of uncultivated soils, and is valuable in preventing him from making bad speculations by introducing new objects of culture into a place which cannot admit of them; yet it is of little avail to examining soils under the immediate influence of cultivation. The experienced eye of the farmer supplies much of this defect. On too loose and poor soils the roots of barley and other grains are long, but the stems small and weak; but in a richer and more tenacious soil the roots are short, thick, and very closely set with fibrils. The reason of these circumstances is, that the root shooting out towards the spots where the stimulus of nutriment is in greater quantity, exhausts the little nourishment it can obtain in adding to its length, and, therefore, an insufficient supply is left for the stem and leaves; but in richer soils the whole of the fibrils being surrounded by nutritious matter, a greater quantity is actually taken up by much smaller surface of roots, and supplies more freely the herbaceous parts of the plants.

To ascertain the real nature of soils, chemistry must lend its assistance; and this mode of examination is undoubtedly the most certain. Sir H. Davy has, however, justly remarked, "that the results of analysis, considered as affording indications of fertility, must necessarily differ according to the variations of climate, situation, and other circumstances. Thus, the power of soils to absorb moisture ought to be greater in warm and dry countries, than in cold and moist ones; and when the quantity of argillaceous earth they contain is larger. Soils, likewise, which are elevated on declivities, ought to be more absorbent than those in the same climate situated in plains and valleys. The productiveness of soils must likewise be influenced by the nature of the subsoil, or the earthy and stony strata on which they rest. Thus, a sandy soil may sometimes owe its fertility to the power of the subsoil to retain water; and an absorbent clayey soil may occasionally be prevented from being barren, in a moist climate, by the influence of a substratum of sand or gravel." [Here follows the mode of examining soils, which will be given in a future number.]

Every farmer knows the fact, that many plants will grow only in certain soils; and his art consists in supplying to the natural soils that part which is most essentially necessary for their support. As we have proved that the components of all vegetable matter are carbon, hydrogen, and oxygen, we must look for the supply of these ingredients in the soil; and it is from water and decayed organic matter that they are undoubtedly obtained. From this matter, then the carbon is supplied; and as water only, and those substances which it can hold in solution,

can be absorbed by the mouths of the roots of plants, the carbon, which is contained in the soil, separated from vegetable and animal matters by decomposition, must be dissolved in the water in order to be taken into the system of the plant; and it thus becomes their proper food.

If this view of the subject, be correct, the art of the husbandman and horticulturist must consist in applying those substances to the soil which will promote the growth of plants without over stimulating them. The different matters known under the titles of manures, which are employed for this purpose, must act in four ways to produce the effect required. 1st They must render the soils of the consistence which will enable them to retain a sufficiency of water; but not too much. 2. They must render it pulverulent to admit the roots of the plants to permeate and spread freely in it. 3. They must enable it to admit and retain air in its interstices; and 4, fit it to form carbon, and afford healthy stimuli to the vegetable irritability. The importance of a finely pulverized soil was first pointed out by Jethro Tull, in 1733; but although his ideas on this subject extended to an absurd degree, and led him to form a theory of vegetation altogether mechanical, yet the direction of the agriculturist to the importance of pulverization has been productive of most beneficial results. It allows of the easy extension of the roots of plants, admits a necessary supply of air during the process of germination, and assists those decompositions which are requisite for rendering manure useful.

The first place among the substances fit to answer the purposes already specified, is certainly due to lime. This substance acts upon soils either mechanically or chemically; and on the plants it acts physiologically. When in the state of carbonate, or united with carbonic acid, it is added to clayed soils, it acts mechanically by rendering them more free, loose, and pervious both to air, moisture, and the roots of plants; it acts chemically when it is deprived of carbonic acid, or is in the caustic state, by destroying worms, and other insects hurtful to young vegetables; and, by quickening the decomposition of their dead bodies, renders them useful to vegetation. In either state it neutralizes acids, and decomposes salt of iron and other injurious saline matters often contained in soils; and by the healthy stimulus it affords when in the state of quicklime, it invigorates vegetation both in young and mature plants. Lime also hastens the decomposition and solution of vegetable matter; and has been long known as a most useful manure when applied where half-decomposed vegetable matter abounds, as for example, in peat soils. The best corrective, therefore, for ground that has been too much dunged, is lime; and peat mosses, which consist of vegetable substances, the decay of which has been suspended by the formation of a peculiar acid in

them are rendered arable and highly fertile by a proper use of lime. In this operation the lime is combined with the acid contained in the moss, and also with carbonic acid, and remains as a component of the newly formed soil. Every kind of quicklime, however, does not answer for manure, and particularly that which abounds with magnesia; for although magnesia, when united with carbonic acid, is a useful ingredient in a soil, yet in its uncombined state or as calcined magnesia, which is that in which it must be, when magnesian limestone is burnt into quicklime, it is injurious to plants: as proved by the experiments of Mr. Tennant. When, however, even the best quicklime is too freely used, it becomes hurtful by over stimulating the growing plants; and, therefore, the more frequent and small application of it is preferable.

The object of all manures is either to alter the retentive quality of the soil, or immediately to supply carbonaceous matter to the plants. For these purposes, as occasion has required, clay, brick, rubbish, limestone, marl, chalk, sand, gravel, has been employed as mechanical means; salts of various kinds as stimulants; and soot, ashes, and dung, as affording the nutriment of plants. That salts are taken up ready formed from the soil by vegetables is pretty certain; Drs. Hamel and Cadet having established the fact, that if the marine plants which yield soda when they grow near the sea, be removed to inland situations, they gradually cease to yield soda, and at length potash only is obtained from the ashes. We shall merely notice, with regard to dung, that when it is completely rotten it does not afford much soluble carbon, owing to its becoming as it were oxydized, and the carbon being converted into real charcoal; other principles also, such as carbonic acid and ammonia, useful both as stimula and nutriment to plants, are dissipated during the violent fermentation which is requisite to reduce dung into this state. Fresh dung, or that which is not completely rotten, on the contrary, benefits not only the present crop but several subsequent ones, as its good effect continues as long as the process of decomposition goes on.

SUMMER FALLOWING, WEEDING,

&c.

“Exposition to the atmosphere is one of the principal advantages. The most stubborn, and unfertile soil, if exposed to atmospheric influence will be improved in its texture, and rendered much better calculated for the process of vegetation. This is effected, either by the soil acquiring properties from the atmosphere, or by those substances which render it barren, being neutralized, destroyed, or washed away.

The fact is, that by no other means but by a complete summer fallow, can a wet bottomed clay be freed sufficiently of the moisture it has imbibed, which having been long locked up in the soil, holds saline and mineral matters in solution. These matters being discharged, the soil readily imbibes fresh water, and gets into a mellow and fertile state. The soil becomes more triable, the crops which it produces are vigorous, and abundant, and, comparatively soaking, freed from weeds.”—(*Extract from Sinclair.*)

An experiment has been made in Scotland by planting potatoes in a part of a fallow field where the soil was favourable, with a greater allowance of manure than the naked fallow; and it was found that the part cultivated with potatoes yielded a less crop of wheat, than the ground that had been fallowed;—the other crops on the fallowed part, were likewise more abundant; and the land much cleaner in the end. The ploughings should be carried on in dry weather, and the cross-ploughing carefully executed otherwise the process will be imperfectly done, and will not produce much benefit to the farmer.

We cannot expect profitable results from naked fallow, if the process is imperfectly done, and certainly that work is seldom properly executed in Canada. Mr. Marshall, in his agricultural work, accounts fallowing to be the best preventive of the wire worm. All herbivorous insects which have not the power of flight, at least in their early stages, are best extirpated by keeping the soil which they inhabit free from every thing herbaceous, especially during the summer months, when they are in a state of activity, and doubtless require daily support. In that case, they must be destroyed in soil that is properly fallowed. In many English countries fallow is thought essential, especially for barley, and it is considered that wherever the soil is strong, clayey, adhesive, and wet-bottomed, it cannot be profitably managed without fallowing.

The expense of six ploughings, six harrowings, and cleaning of an acre in England, is estimated at £3 11 6. It would not cost so much in Canada. In Flanders, much of the land is trenched with the spade, and light soils are preferred for that operation. The expense on light lands, trenched 18 inches deep, is £1 6 0 per acre. On strong lands, 18 inches deep £1 11 per acre. And on strong lands, 2 feet deep, £2 5 0 per acre. In parts of England where men are to be found accustomed to dig, light lands would be trenched at £2 10 0 per acre.

Summer fallowing would be extremely beneficial to the strong clay lands of Canada. But unless the lands to be summer fallowed are ploughed in the previous Fall, the work is not likely to be well executed subsequently.

The following remarks on Clay Soils, are from the "Penny Cyclopædia," and correctly apply to much of the soil of Canada:—

"Clay is an essential component part of all fertile soils. A clay soil consists of a large proportion of alumina, united to silica, of various degrees of fineness, and frequently also a portion of carbonate of lime. When the silica is very fine and intimately mixed with the alumina, the clay although stiff in appearance, is fertile in proportion to the humus which it contains, or which is artificially added to it. It then forms the class of rich wheat soils which produce successive abundant crops without change or manure. It has a strong affinity for water, which prevents the plants that grow in it being injured by drought; and it has a sufficient degree of porousness to allow superfluous moisture to percolate without making it too soft. All that is required for such soil is a porous substratum of rock or gravel; and where this is not the case, sufficient drains must be made to produce the same effect.

When clay soils are well drained, and when the effect of noxious salts has been removed by liming, burning, and frequent stirring, it will be found that a much smaller quantity of manure will produce a certain return in grass or corn, than on any light soils. The great difficulty is to choose the time when stiff clays are to be worked; and here it may be observed, that ploughing sometimes does more harm than good. When clay is wet, especially in the beginning of summer, and it is ploughed in the regular process of fallowing, the tough moist slice cut out by the plough is set on edge, and the sun bakes it into hard mass like brick. In this state it is not improved by exposure to the air, which cannot penetrate this hard substance. It would be much better to plough out deep water-furrows with a plough made on purpose, and wait until the moisture is reduced by gradual percolation and evaporation; so that the plough should raise a slice ready to break and crumble as it is turned over. This should be done immediately before winter, and then the frost will so divide and mellow the soil, that, provided it be kept free from superfluous water by drains and water-furrows, it will have the appearance of the finest mould when worked with the harrows in Spring. To plough it again would be to spoil all. It should have received the necessary manuring in Autumn, and be ready for the seed to be sown on this pulverized surface. The horses which draw the harrows or the sowing machines should be made to walk in the furrows, which should afterwards be deepened out with the spade, or by a plough constructed for the purpose. A free course and outlet should be formed for all surface water; for no maxim is more true than this, that stiff clays are never injured by a continuance of dry weather, unless they were in a wet state imme-

diately before. The driest clay contains sufficient water to supply the roots of plants for a long time; but wet clay, in drying and shrinking, destroys the texture of the roots by mechanical pressure. This may be of use when weeds are to be eradicated, and in that case a different mode of proceeding may be recommended; but when good seed is sown, the clay should be in such a state as to crumble under the harrows, and it should not be too moist. Experience has taught the plough-man that clay soils should be laid in round lands or stiches; and much of the produce of a field depends upon the skill with which this is done. It is not only the surface which should lie in a rounded form, but the bottoms of the furrows should lie in a regular curve, without small ridges or inequalities between them; so that when heavy rains penetrate through the whole thickness which the plough has raised, the water may find its way into the intervening furrows, without being retained by the small ridges left by an unskilful ploughman. It is seldom that a common labourer can be made to perceive the consequence of his carelessness. The slightest inclination of the plough to either side makes an inclination in the bottom of the furrow. An inequality in the depth does the same. The usual method is to increase the depth of the ploughing from the crown of the stich or ridge to the outer furrow. If the land has been cross-ploughed or dragged level before the last ploughing, this may answer the purpose; but if the stiches are only reversed, and the centre of the new stich is to be where the water-furrow was before, it requires twice ploughing to bring the stich to its proper form, and this is not always done for fear of trenching the land too much. Hence it is always preferable, where it can be done, to lay the land flat by cross ploughing and harrowing, before it is raised in stiches or ridges. The narrower the stiches are, the drier the land will be. The most convenient width is five foms, as it is called, that is, five furrows on each side of the centre, which allowing nine inches for each furrow, makes seven and a half feet, leaving 13 inches for a water-furrow, which is deepened into a narrow channel in the middle.

Clay land will bear a repetition of the same crops much oftener than lighter lands; but every scientific agriculturist knows the advantage of varying the produce as much as possible making plants of different families succeed each other. The cereal grasses are one family, which is the reason why wheat, oats, barley, &c. do not succeed so well after each other as after leguminous plants or clover."

The foregoing remarks will give a very good idea of the best method to manage strong clay lands. By summer fallow, one year's crop is lost certainly, but the second year the land may produce a crop that would be more valuable

than two crops obtained without summer-fallowing, and the land will be left in a much more fertile and profitable state. Indeed according to the Canadian plan of managing land, leaving it one year idle, or growing natural grass and weeds, and the next year, once ploughing it for a crop, we may say that only one crop, and that very frequently a bad one, is obtained in two years, so that to summer-fallow the land cannot be considered to cause the loss of a crop.

Weeding is simply the extracting of such plants as it is not desired or needful to cultivate. The operation may be performed in various ways, by the hand alone; aided by a broad pointed knife; by gloves or by the aid of forks, spades, or other weeding-tools. In weeding thistles from pasture land, it has been found in England, that breaking or bruising them over, renders the roots much less liable to spring again the same season than cutting or even pulling them up. About the 1st of July is a good time to cut down thistles on pasture. They have to be destroyed before this period in the growing crops. It is necessary, early in June, to take them out of wheat, barley, oats, &c. or they cannot well be meddled with after. They are very subject to spring a second time in the growing crops, but they do not generally grow to any considerable size to do injury.

Preventing the soils from being injured by weeds, is attended with much greater difficulties than is commonly imagined.

It is most important to free the cultivated soil by every means that can possibly be devised, from those destructive intruders, and to prevent their growth in grass lands, on the sides of the roads and other places wherever they are to be found.

It is the more necessary to attend carefully to this subject, as the powers of propagation, which have been imparted by nature to this description of plants, render it extremely difficult for farmers to prevent their growth. Many of them are propagated by their roots and their seeds. Some plants extend their roots so far under ground, that it becomes extremely difficult to dig them up. In some instances new plants spring up from every joint left under ground. Others stretch out runners or stolons every way above ground, and to a considerable distance, while many plants, from their seeds having wings, by which they are scattered about by the wind in every direction and frequently to a considerable distance. These are so dangerous as to require every effort to have their future progress arrested, by cutting them down wherever they are to be met with, before or as soon as they have flowered.

In Canada, weeding is much neglected. Some of the richest and most fertile portions of the soil, near farm houses, and by the fences and drains, is allowed to be almost exclusively

occupied by useless and hurtful weeds—weeds also occupy a portion of the surface of the cultivated soil, and thereby the production of useful plants is considerably lessened. Any regulations, Civil or Legislative, that would contribute to the destruction of weeds, would greatly improve the appearance of the country—would be highly advantageous to the industrious and careful farmer, and to the general interests of agriculture. Farmers have no right to hold lands, if they allow them to be overrun with weeds, that must scatter their seeds over their neighbours' farms to their great injury.—*Evans' Agricultural and Industrial Magazine.*

FROM PARK'S CHEMICAL CATECHISM.

Chemists have agreed to call the matter of heat, *Caloric*, in order to distinguish it from the sensation which this matter produces. Caloric is everywhere indispensable to the existence of man. "It is with fire that, in every country, he prepares his food, that he dissolves metals, vitrifies rocks, hardens clay, softens iron, and gives to all the productions of the earth forms and combinations which his necessities require." The sun is the principal, and, probably, the original fountain which furnishes the earth with a regular supply of caloric, and renders it capable of supporting the animal and vegetable creations.

According to the laws of nature, animal and vegetable life are both very much influenced by the temperature in which they exist; we therefore find different kinds of vegetables, and a different race of animals appropriated to the different climates of the earth.

That caloric is as necessary for the support of vegetable as it is for that of animal life, may be proved by direct experiment. If, in the midst of winter a hole be bored in a tree, and a thermometer put in it, it will be seen that the tree is many degrees warmer than the atmosphere. Caloric is the cause of fluidity in all substances which are capable of becoming fluid, from the heaviest metal to the lightest gas. When the temperature of the atmosphere is reduced below 32° water gives out its superabundant caloric by degrees, till at length the cold atmosphere robs it of its caloric, of fluidity also, and it becomes ice.

Owing to the distance of this globe from the sun, and to the vast mountains of ice at the poles, the atmosphere over a large portion of the earth is at times reduced to so low a temperature, that were it not for a wise provision of Providence, all vegetable life must be destroyed. Caloric has always a tendency to equilibrium; therefore, if the temperature of the air be lowered, the earth cools in proportion; but, when the atmosphere is reduced to 32°, the water which is held in solution becomes frozen, and precipitates in the form of snow upon the

earth, covering it as with a carpet, and thereby preventing the escape of that caloric which is necessary for the preservation of those families of vegetables that depend upon it for their support and maturity. Be the air ever so cold (and in the northern parts of the Russian empire it is sometimes 70 degrees below the freezing point) the ground, thus covered, is seldom reduced below 32°, and is maintained equally at that temperature for the purpose above mentioned. How multiplied are the means which nature has adapted for the preservation of all her productions.

The quantity of heat given out in freezing occasions the progress of congelation to be extremely slow. The constant emission of caloric from the freezing substances operates favourably; for thus the severity of the frosts is mitigated, and its progress retarded. On the other hand, if the return of caloric to the frozen body of water were not equally slow, what sudden inundations would be occasioned, in those countries where large masses of ice are collected, at the first approach of summer, as has before been remarked. That the melting of ice produces cold, is seen in many operations. By melting ice with common salt, confectioners produce cold much greater than that of the original ice.

In general, all bodies, whether solid or fluid, contract their dimensions, and become of more specific gravity when cooling. This axiom has been long known and acknowledged: but water affords a remarkable and striking exception. Water, as it cools below 42°5, instead of contracting and becoming of greater specific gravity, actually becomes increased in bulk, and its specific gravity continues to lessen as it cools. From experiments, it has been found that water becomes of less specific gravity, whether it be heated above or cooled below 46°5; a fact too astonishing ever to have been discovered or imagined a priori. The wisdom and goodness of the GREAT ARTIFICER of the world will manifest itself in this arrangement, if we consider what would have been the consequence had water been subject to the general law, and like other fluids, become specifically heavier by the loss of its caloric. In winter, when the atmosphere becomes reduced to 32°, the water on the surface of our rivers would have sunk as it froze; another sheet of water would have frozen immediately, and sunk also; the ultimate consequence of which would have been that the bed of our rivers would have become repositories of immense masses of ice which no subsequent summer could unbind: and the world would shortly have been converted into a frozen chaos. How admirable the wisdom, how skilful the contrivance, that, by subjecting water to a law contrary to what is observed by other fluids, the water as it freezes becomes specifically lighter, and, swimming upon the surface, performs an

important service by preserving a vast body of caloric in the *subjacent* fluid from the effects of the surrounding cold, ready to receive its own accustomed quantity upon the first change of the atmosphere!

These reflections, perhaps, will not be thought misplaced should they but afford.

"One ray of light in this terrene abode.
To prove to man the goodness of his God."

ROTATION OF CROPS SUITABLE TO THE DIFFERENT DESCRIPTIONS OF SOILS.

From Evans' Treatise on Agriculture.

The distribution of crops, and plan of their succession, is one of the first subjects to which farmers require to direct their attention. Whatever little regard has been hitherto paid by farmers to a proper rotation of crops in Canada, it is now a point on which their profits depend more than on any other. The kind of crops to be raised, are determined in a great measure by the climate, soil, market, and demand.

It has been found by experience, that besides the general exhaustion of humus or vegetable food produced by vegetation, especially those plants which bear farinaceous seed, each kind of crop has a specific effect upon the soil, so that no care or manure, can make the same ground produce equal crops, of the same kind of grain, for any length of time without the intervention of other crops. Whether this be owing to any peculiar nourishment necessary to each particular kind of plants, or because plants not indigenous degenerate in a foreign soil, the fact is certain with respect to most crops usually raised. This points out the advantage of varying the crops, accordingly as they are found to succeed best after each other. In general, all kinds of grain succeed best after a crop which has been cut before the seed has ripened, or the stem is dried up. Those plants which have a naked stem with few leaves, thrive best after leguminous plants, which have more succulent stems, and which bear their seeds in pods, as peas, beans, tares, or vetches, or after succulent roots, which strike deep into the ground, as carrots, parsnips, beet roots, and even potatoes. From this circumstance, confirmed by universal experience, the different systems of rotation have had their origin, taking the nature of the soil into consideration.

In the British Isles, where farmers have to pay heavy rents on short leases, there might be some excuse or justification for farmers deteriorating the lands by severe cropping; but here no such necessity exists, and consequently no such justification. Farmers are proprietors, and if they exhaust the soil by tillage beyond the point consistent with good management, they will be sure to pay dearly in the end for every

crop forced from the land unreasonably. A farmer who is a proprietor, cultivating his own land with skill and experience, if he understands the quality of his soil, and state of his fields, will know what crops are most likely to grow well in each; he will know what is most in request, both for his own use, and in the market, and he will act accordingly. But if he allows his land to be impoverished for want of rest or manure, or to run wild with weeds, he does not exercise the experience, judgment or activity, necessary to make his profession and pursuits profitable, whatever his skill or experience may be.

The system of rotations is adapted for every soil, though no particular rotation can be given for any one soil which will answer in all cases. In some situations much depends on the kind of produce for which there is the greatest market demand; indeed, this will influence rotations directly or indirectly, in every situation. But whatever the system of rotation that is followed, if the several processes of labour which belong to it are properly executed, land will rarely get into a foul or exhausted state, or at least, if foul or exhausted under a judicious rotation, matters will be much worse when any other system is followed.

The particular crops which enter into a system of rotation must be such as are suited to the soil and climate, varied by local circumstances, such as the proximity to towns, where there is generally a demand for potatoes, carrots, turnips, hay, &c. In a thinly peopled district, peas, beans, tares, flax, summer fallow, clover, and timothy might be interposed between corn crops on clay soils, and potatoes, carrots, Indian corn, clover and timothy, on dry loams and sands. A variety of plants, such as peas, tares, flax, Indian corn and carrots, might occupy a part of that division of a farm which is allotted to green crops, and on good lands, well managed, these plants might be grown to prepare the soil for wheat without perhaps resorting to summer fallow, except very rarely.

A farm of strong, rich soil, divided into six fields or enclosures, might have half the farm under different species of cereal grasses, or grain crops, peas, beans, tares, roots, or plain fallow; the other half under cultivated herbage, meadow and pasture. The rotation and distribution of crops might be the following:

One field or division, equal to one-sixth of the arable land, to be under wheat certainly, if the soil is suitable, if, not, barley or oats should be substituted. The wheat is to succeed green crops, or summer fallow, and the land, with this crop, or any other crop substituted for it, to be sowed down *invariably* with clover and timothy, or other grass seeds. Second field, one-sixth, ploughed in the previous fall, after pasture, to be in peas and oats, or perhaps all oats. Third field, or one-sixth, (following after oats and peas

the year before,) to be manured with beans, mangel wurtzel, potatoes, carrots and flax; and should the farmer be unable to find manure for the whole division, he may fallow the remainder, or sow tares, or some other green crop that he might plough in as manure if necessary. This last division will be prepared for wheat or barley the ensuing spring, and be seeded down with whatever crop is sowed. The other half of the arable land comprising three fields or divisions, should be in meadow or pasture. One field or division, equal to one-sixth of the whole, coming annually into tillage, to replace the division seeded down yearly with the crop of wheat or barley as before stated.

On farms of light or sandy soils, divided into nine fields or enclosures, the tillage should not exceed one-third of the arable land, or three fields in tillage, and six in meadow or pasture. By this rotation, the land would be under grass six years out of nine, instead of three out of six, as in the first rotation, the management and course of cropping for the part in tillage, to be the same as that laid down for the rich, or clay soil, varying the distribution of crops to suit the quality of the soil, and introducing Indian corn in this rotation.

It may be expedient to vary from these rotations. The experienced farmer will understand when and in what manner it will be prudent to do so. I believe, however, that the more nearly the rotation adopted in Canada, is conformable to these general rules, the more certain will be the *profitable* improvement of agriculture. This system of convertible husbandry, is the most suitable to the present circumstances of this province, and of British America. Under this course of husbandry, the lands would be constantly in good heart, capable of producing abundant and excellent crops, and though the largest portion may be under cultivated herbage and grass, I am well convinced the gross produce of the land, and the farmer's profit, may be augmented two or three fold, if the produce be judiciously applied, and the rearing and feeding of cattle, for the dairy and the shambles extensively introduced. Peas, beans, tares and roots, may be raised in this rotation in great abundance, for feeding cattle and hogs and a greater quantity, and better quality of grain produced in one year, than under the present system of farming can be produced in two.

No food, no cattle; no cattle, no dung; no dung, no corn, is a maxim that ought to be fixed in every farmer's mind.

In a report of select farms in England, one in Cumberland, of excellent soil has adopted the following rotation: On clay soils of the best description, first year, summer fallow, sometimes green crop; in either case, the land thoroughly cleaned, limed, and manured. Second year, wheat, with grass seeds for pasture. Third and fourth years, pasture. Fifth year,

pasture, top dressed with lime or compost. Sixth and seventh years, pasture, and ploughed in the Fall for oats the succeeding Spring, to be followed by summer fallow, or green crop.

On gravelly soils: First year, green crops, well manured. Second year, barley, with grass seeds. Third and fourth years, pastured. Fifth year, pastured, and top dressed with compost. Sixth, seventh, and eighth years, pastured.

Ninth year, oats, out of lay, and the rotation begins again.

It is no wonder that land managed in this way should be constantly in the best condition, producing from 34 to 38 imperial bushels of wheat to the acre, on an average of favourable years; and I am well persuaded this kind of rotation is more profitable in every way than the scourging one of constant cropping, however well ploughed or manured the soil may be.

Not to repeat the same kind of crop at too short intervals, is a rule with regard to the succession of crops, that ought to be strictly observed. Whatever may be the cause, whether it is to be sought for in the nature of the soil or of the plants, experience clearly proves the advantage of introducing a diversity of species into every course of cropping. On new land, or land that has been pastured several years, before it is again brought under the plough, there may be less need of adhering steadily to this rule; but the degeneracy of wheat, and other corn crops recurring upon the same land every second year for a long period, has been generally acknowledged.

Wheat it is supposed cannot be grown in perfection, on an average, more frequently than once in every five years on the same land. Beans, peas, potatoes, carrots, and red clover, that may be called green crops, become less productive, and much more liable to disease, when they came into the course, upon the same land, every second, third, or fourth year. What the interval *ought* to be has not yet been ascertained, and from the great number of years that the experiments must be continued, to give any certain result, probably cannot be determined until the component parts of soils, particularly the sort of nourishment which each species of plant extracts from the soil, have been more fully investigated. All good farmers will, however, avoid overcropping, or treating land in any way so as to exhaust its powers, as the greatest of all evils.

DEEP CULTIVATION.

Under this head I propose taking a cursory view of the causes that produce the beneficial effects that follow their execution; and afterwards, to confirm those facts by describing the results of my own experience.

There is an evident necessity of seeing the causes of the effects that govern our daily prac-

tice, that we may be enabled to remove them (if possible) when attended with injurious influence, and thus obviate former difficulties—and thus empower us to govern those effects that now govern us, and so enable us to guide our daily practice with that minute precision so needful to profitable culture.

Under the powerful influence of carbonic acid, oxygen, and moisture, the hardest rocks are crumbled; human structures are by them and rain water swept away—soils disintegrated, and constituents liberated in a fit state for the plants' reception: yet are these destructive agencies too slow in their action to merit the attention of many agriculturists.

Notwithstanding that the mechanical operations of ploughing, harrowing, &c., accelerate disintegration and liberation, we have no clear proof that they are strictly concomitant. It is enough for us to know that liberation will be produced in proportion to the exposure of the soil to the destructive agencies of the air—that it is brought to pass through atmospheric influence; and it is natural we should strive to deepen and pulverize our soils, thereby exposing every particle to be acted on by chemical solvents.

Perhaps the greatest of all means connected with fertility is an equal supply of moisture. Without an equal supply of moisture, vegetation languishes; the soil is irregularly assimilated by the plant and, consequently, our crop is deficient in bulk.

When a fertile soil, possessed of a good supply of carbonate of lime and finely divided clay, has a thorough division of its parts, it has the power of absorbing a large amount of moisture from the atmosphere during the night in dry weather; whilst deep cultivation will enable it to retain, in its interior, a supply equal to the demand of the plant, when most required; and by increasing the velocity of the water passing through the soil, a more speedy evaporation will be gained, and less of that chilling process—evaporation—will follow.

By deeply and properly cultivating a fertile soil, we provide for the plant a fitting receptacle—a receptacle sufficiently deep to permit them to penetrate beyond the scorching influence of the sun's rays, and in which every obstacle is removed for its speedy and equal supply of abundance of nourishment.

These were the views held by me in the year 1816, when, to test their accuracy, the following experiment was instituted on a piece of thorough-drained land situated on the Weald clay formation. It was found to contain an abundance of decaying organic matter to the depth of eight inches, the usual depth of cultivation. In the autumn the soil was forked twelve inches deep, turning up and exposing to the pulverizing influence of the winter's frosts two inches of clay and vegetable mould mixed,

which apparently had never before been brought to the surface: at the same time loosening two inches more that were left at the bottom. Thus the roots had four inches more pasture than was commonly supposed could be advantageously stirred, two of which were brought to the surface. Care being taken to effect the complete pulverization of the soil in the Spring, to the depth of seven or eight inches, it was afterwards cropped with carrots and cabbage, which fully repaid the expenditure. The plants flourished with equal luxuriance with those on land dug to the usual depth (8 inches) until the month of July, when the want of moisture gave a severe check to those on the latter, whilst the former gave a satisfactory proof of the efficacy of deep cultivation.

The crops on both soils were not weighed, but the deep dug portion was computed to contain a greater weight, in proportion to the additional depth of the soil. I am not sanguine enough to expect a double return by doubling the extent of active soil, but that the increase of produce will more than repay the outlay I fear not to assert.

By deep cultivation we expose a greater extent of surface to the destructive agencies of the atmosphere, and, consequently, the liberation of the food of the plants is accelerated; and, by a sufficient and equal supply of moisture, and by the aid of additional fibres, the nourishment that was before irregularly conveyed to the plant, in a fit state for its reception, is transmitted regularly and in sufficient quantity to support its constant growth. This, with the prolonged growth in the autumn, will easily account for the superior crops attained by deep cultivation.—*George Summers, Stoke Walke, Dorset.*

P. S.—I suppose it unnecessary here to remind my readers of the incapacity of a soil to absorb moisture in any weather when not permeable to the atmosphere, or to remind them of the injurious influence of certain subsoils on vegetation.—*G. S.*

The varieties of soil suitable for compost need not be particularized. All soils are benefited by the mixtures, if they are properly adjusted to the circumstances under which it is applied; the application of an earth to form the basis of a compost being regulated chiefly by the mechanical character of the soil. But the special fertilizing properties of an earth for compost, may with advantage, be considered, at the same time that we have in regard due attention to its mechanical effect upon the soil.

It is usually considered, that to attain the full mechanical as well as chemical influence of a compost, we must apply a large quantity of it. But by a judicious mode of applying an earthy compost, this end, so far as the growing crop is concerned, may very frequently be secured with little trouble. The best method is

to apply the fine fertile compost soil by *drill* along with the seed; so that the young plant shall, in some degree, exist in the artificial soil. In Yorkshire, the drill machines, which are capable of distributing bulky composts, are much in favour on strong soils; and unquestionably, enable many farmers to secure a plant, and to attain a luxuriant crop, in soil that is of a very unfavourable texture. Mr. R. S. Grabb of Glastonbury, Somerset, very properly directs attention to this feature in the application of composts, by which mechanical advantages are attained with little cost of application. "The admixture," says he, "of soils by the aid of the improved drills, has not sufficiently engaged attention. The cultivator of clay soils is enabled to grow Swede turnips, by depositing with the seed a *seed bed* of light earth, in which the young plants will flourish, until able to derive support from an imperfectly pulverized soil. The occupier of soils too light for the growth of heavy samples of wheat, is enabled, by the deposition of a strong earth, rich in the elements favourable to the support of wheat, to produce the grain of good quality; and the occupier of peat soils, abounding in vegetable matter, but deficient in earthy substances is enabled, in the absence of clay, by frequent application of small quantities of earth, sand, or gravel, to convert a merely vegetable and root-producing soil into a highly valuable soil, fitted for the growth of grain of excellent quality."

Lastly, earthy composts are well adapted for mixing with artificial manures. Substances which are small in bulk, or which are apt to injure the seed by too immediate contact, may, when thus added to the compost heap, be evenly and safely distributed.

TREATMENT OF THE MODERN WINDOW.—The office of function of the window is not a more important one in the pointed style than it is in the classic: it has as strong a claim to consideration and character in the one as in the other, and therefore no good and sufficient reason can be assigned why, while the jambs of the Gothic window enshrine a labyrinth of beauty and intricacy of decoration, the filling up of the classic window should be entirely neglected in the way of design. I say neglected, but it seems worse than neglected: not only have imagination, taste, artistic feeling, had no part in the design, but it is positively marred by the sash in common use. The straight sash-bars, dividing it into a series of equal squares, do not improve the appearance of the humblest cottage, but in an architectural composition they are an injury. In most instances a spectator, ignorant of the custom, would be led to conclude that the architect had abandoned this portion of the façade to the joiner, who had filled it up in the cheapest manner he could.—*The Builder.*

THOUGHTS ON STEAM PLOUGHS AND AGRICULTURAL PROGRESS.—We do believe that an era of agricultural development, as fast and wonderful as that which the present age has already witnessed in manufactures, is not only within the bounds of probability but on the eve of advent—that a time is at hand when our present primitive agricultural implements will be put away as curiosities beside the distaff and the spinning-wheel—and that the alleged discovery by Daguerre of a mode of rearing three-year plants in three months—the reported power of some of our market-gardeners to rear a salad (like a mushroom) in a single night—the alleged power of the Japanese to dwarf the lofty pine into a miniature tree, a few inches only in height—the traditional story of the monks of Glastonbury Abbey, who could make the hawthorn bloom at Christmas—or even the trick of the Indian jugglers, who appear to cause a mango seed to spring up out of the soil in course of a few hours, and before the eyes of hundreds, unfolding leaves and flowers and fruit—are all but, at the worst, vaticinary imaginings, or rudimental typifying ideas, of actual power of nature, scarcely less wonderful, and yet to be developed—just as was the old traditional idea of the magnetic telegraph of separated friends, with its needles and alphabets, but without any record of its invisible connecting wire—alone wanting to reduce it all to credibility. Believing, at all events, as we decidedly do, that a great era of agricultural development is at hand, when even the steam-plough, as it at present exists, may be a rude implement, it is interesting in such belief to witness just such beginnings of this anticipated era as were the first steam-engines or the first spinning and weaving machines in manufacture, or the locomotive with legs, like a horse, in the railway system. The steam-plough may, even yet, be just such an implement with relation to agriculture.—*The Builder*.

COUNTRY MILK MARKETS IN LONDON.—The London and North Western Company are erecting a milk market on their station in Lime-street, Liverpool, from designs by Mr. Woods, one of the engineers. It will be covered by an iron roof by Mr. Turner, of Dublin. Such milk markets erected near the metropolitan termini of the various lines would have an unequivocal interest in upholding them, if based, as they doubtless would be on a more substantial foundation than the old "London chalk."—*The Builder*.

We did not make the world, we may mend it, and must live in it.

It is to be doubted whether he will ever find the way to heaven, who desires to go there alone.

Do nothing in thy passion; why wilt thou put to sea in the violence of a storm?

Wisdom is generally an acquisition purchased in proportion to the disappointments which our own frailties have entailed upon us; for few are taught by the sufferings of another.

Physiognomy—reading the hand-writing of of nature upon the human countenance.

Let the bent of thy thoughts be to mend thyself, rather than the world.

The hate which we all bear with the most Christian patience is the hate of those who envy us.

THE CITIES OF LONDON AND PARIS COMPARED.

—The report of M. Darcy, divisional inspector of the Ponts et Chaussées, who has been to England to obtain information relative to the macadamised roads, has just been published. In this work we find the following particulars relative to the population, extent of the streets, &c., in Paris and London:—The total surface of London is 210,000,000 of square metres; its population, 1,924,000; number of houses, 260,000; extent of the streets, 1,126,000 metres; extent of the streets, not including the foot-pavement, 6,000,000 metres; extent of the sewers, 639,000 metres. The total surface of Paris is 34,379,016 square metres; population 1,053,879; number of houses, 20,526; extent of the streets, 425,000 metres; surface of the streets exclusive of the foot-pavement, 3,600,000 square metres; length of the sewers, 135,000 metres; surface of the foot-pavement, 888,000 metres. Thus, in London, every inhabitant corresponds to a surface of 100 metres; at Paris to 34 metres. In London the average of inhabitants for each house is $7\frac{1}{2}$; at Paris 34. At London the average length for each house corresponds to 40 metres 40 centimetres; at Paris, to a length of street of 15 metres. These details establish the difference which exist between the two cities, from which it appears that there is in London a great extent of surface not built over; that the houses are not very high, and that almost every family has its own. The Boulevards of Paris is the part where the greatest traffic takes place, and the following are the results of the observations of M. Darcy on this subject:—On the Boulevard Poissonniere, 7,720; Boulevard St. Denis, 9,609; Boulevard des Eilles du Calvaire, 5,856; general average of the above, 8,600. Rue du Faubourg St. Antoine, 4,030; Avenue des Champs-Elysées, 8,959. At London, in Pall-mall, opposite her Majesty's Theatre, there pass at least 800 carriages every hour. On Westminster bridge the annual traffic amounts to not less than 8,000,000 horses. By this it will be seen that the traffic in Paris does not come up to one-half of what it is in the macadamized streets of London.

True merit, like deepest rivers, make the least noise.

Agricultural Journal

AND

TRANSACTIONS

OF THE

 LOWER CANADA AGRICULTURAL SOCIETY.

 MONTREAL, DECEMBER, 1850.

What are the best means to adopt in order to promote the improvement of agriculture in Lower Canada *where its improvement is most required*. This is a question of importance with all true friends of the general improvement of Canadian agriculture, and the prosperity of the country. We have no doubt there is a diversity of opinion as to the best means, but by fair discussion, we may arrive at something like a just conclusion, and it would afford us much satisfaction to have this subject fairly discussed, not in a covert and underhand manner, but in this Journal, or some other newspaper, where the public may be able to judge. We rejoice in believing that there is not at present a farmer's family in Lower Canada, that has not some member of the family capable of reading: If this be a fact that is capable of proof, which we have no doubt of, can there be any better means of producing a spirit for enquiry, and improvement, than by the circulation of a well conducted Agricultural Periodical amongst the people, that would suggest improvements, and report experiments, and the results of a good system of agriculture elsewhere? Could this possibly have any other tendency amongst the rural population than a useful one? Could there be any other periodical or newspaper circulated amongst them that would do more good, and as little harm? We answer, No. — we are prepared to sustain this reply. It may perhaps be imagined that the Lower Canada Agricultural Society have been wanting in their duty, in not having an Agricultural Exhibition annu-

ally. The County and District Societies have had their Exhibitions, and the country must have had the full benefit of all these Exhibitions for the promotion of Agricultural improvement. The Lower Canada Agricultural Society have directed their attention to other means of producing the improvement of husbandry, which neither the County or District Agricultural Societies have adopted, and thus made up what was wanting. We have the opportunity of observing that these means have been successful, to a reasonable extent, and to an infinitely greater extent, than could be produced by any Exhibition that was in their power. We have had many Exhibitions, but we should regret extremely were we to believe that the exertions of the Lower Canada Agricultural Society, have not been productive of more usefulness to the rural population of this country, then all those Exhibitions put together. This may be considered as assuming a good deal but we are prepared to sustain our position by reference to respectable parties throughout the country, and by an extensive correspondence on this subject. All the good things that were to exhibit, have been exhibited, it may be presumed, and what useful purpose could it have served to have exhibited them again? We are not by any means unfriendly to a great Annual Agricultural Exhibition but on the contrary, would be very happy that the Lower Canada Agricultural Society would have the means to hold one regularly. We only state, that this Society have applied their funds for the time past, in the best manner possible, to advance Agricultural improvement in Lower Canada, and the Report of the Agricultural Committee of the Legislative Assembly last Session, will fully sustain us in this assumption. We do not pretend to say that all that was necessary, and possible to be done has been done, because there was not means. This Journal has advocated Agricultural Schools and Education, and Model-Farms;

and of course these things would require ample means for their general establishment, which this Society did not possess. We hope it is not assuming too much, to pretend that we have advocated in this Journal many useful measures that would be of vast benefit to Agriculture and to the country generally. We may not have advocated all that would be necessary, but we hope we have not suggested any that would be prejudicial to Agriculturists or to the community. There is another circumstance, which, we trust, we may be pardoned for advertg to—that is—our anxious desire that this Journal should be strictly Canadian, and that we should maintain the character of Lower Canada as not inferior in any respect to any part of North America, so far at least, as regards her natural capabilities and advantages. When this is the fact, the improvement of all those advantages is in our own power. These propositions we have constantly maintained. Would it then be too much to presume upon the zealous support to this Journal by all true friends of our beloved country? Would it be too much to expect that it would be supported in preference to any foreign Agricultural Journal, even though it should not have equal merit in every respect. The annual subscription is not much to every farmer, even though he should not read it, and subscribe to foreign Journals for reading and information. We have ever found farmers great advocates for the encouragement of home industry. They forget this principle when they encourage foreign Agricultural periodicals in preference to Canadian. In conclusion foreign Agricultural periodicals are generally unsuitable for French Canadian farmers without revising and translating. This would be an expense equal to that of publishing this Journal in the English and French languages. What then is to be done? We do not pretend that every Canadian farmer who can read takes this Journal; but we do say, that a considerable number take it and read it, and that it is also taken by some of the country schools.

We can also say that the number of subscribers to the French Journal is larger than to the English. If it was not published, all those who take it would be deprived of what they must consider an advantage. On what grounds of patriotism or fairness then would it be expedient to discontinue the Journal, and deprive Canadian farmers of the opportunity of taking it and reading it—granted that foreign periodicals may possess as much merit in the estimation of some parties as this Journal, yet they are not in a language nor in other respects suitable for a vast majority of the farmers of Lower Canada, and last, but not least, they are not Canadian, nor are they by any means in Canadian interests, as they are opposed to reciprocal free trade between the United States and Canada. We advocate equal opportunities and equal advantages for every class of farmers in Canada as a common right, and this they could not have were not agricultural works accessible to all in a language they understood. A regular periodical has the advantage over books, as it constantly reminds farmers of what may be done, reports new experiments and their results, and may suggest many useful hints, for every day work, that might not be so attractive to the farmer in a book. Coming at stated periods, it creates an interest and desire for information. If a farmer finds even a few lines in one number that he considers useful, he is anxious to see the next number, expecting that it might also contain something interesting. Books do not have the same effect of creating a constant interest.

There cannot be any doubt that it would be highly advantageous to this country that manufactories should be established for supplying our own wants as far as possible, and thus raising up to a certain extent a class of customers for agricultural products at our own door. This home manufacture might, at all events, be introduced, so far as this country would yield the raw products for them. It would be a double advantage to manufacture the raw products of Canada for our own use

instead of exporting them, and sell to the manufacturers here as part of the raw products what we now export to buy manufactures from a distant country. The expense of exportation and importation would be thus saved to the Canadian producer and consumer, and a home trade, the most profitable of all trades, established. We do not pretend that such a trade would do all that is necessary for us, or that it should give us a market for all we would have to dispose of, or supply us with all we would require. We only say that home manufactures of our own raw products, for partly supplying our own wants, would be a very useful help to Canada and her people. Any country situated as this is, so remote from market, should endeavor to manufacture, to the fullest extent that she can do so profitably, for her own people. We shall always have a large trade both in imports and exports, although we may have some manufactories of our own. We rely upon the export trade, because we shall be able to supply the British Isles and other countries with products they cannot obtain so well elsewhere. This is the only encouragement we may expect, but fortunately it will be certain and durable. We shall also require to import many things that we cannot manufacture. The prospects for Canada are most cheering for the future, if we improve the advantages that are in our power. There is nothing like ruin and decay to apprehend. Indeed the country is too fine a one to be brought to ruin or decay by any portion of its inhabitants. It may be possible to retard its general prosperity for the want of united action in measures that are necessary to insure general prosperity, but we may rest satisfied this state of things will not continue long. We have too many advantages inviting us to make use of them to be long neglected by our population. Education and the introduction of capital would soon stir up the most dormant faculties.

THE RUTLAND WHEEL PLOUGH -- This excellent plough is manufactured by Ransome

& Co., Agricultural Implement Manufacturers, Ipswich, England, and the name of the manufacturers is so well known that it is a sufficient recommendation to any implement coming from their establishment. We imported one from England some time ago, and our object in doing so was, as we have before explained, that it might be the means of introducing some improvement in the Canadian Wheel Plough, or the importation of the Rutland Wheel Plough. This plough was exhibited at the late Montreal Industrial Exhibition, but we were surprised to find that it was passed over, although certainly deserving of notice and commendation. It was not sent there to catch a prize, but to show the sort of ploughs that was esteemed worthy of a prize in the first agricultural country in the universe. This plough has been at work since the Exhibition, and it has been seen at work by respectable gentlemen, who expressed their satisfaction at the perfect manner it executed the work. It was draughted by two rather small sized Canadian horses, and we shall answer for it, that there is no iron swing-plough of lighter draught, or that can execute the work in a better or more perfect manner. There is no difficulty in determining the merits of the plough by any party who sees it in operation. The wheels, mould board, muzzle and rack can be adjusted to any size of furrow-slice, in depth or width, that may be required, and in the hands of any ploughman accustomed to use such a plough, and with horses of strength proportioned to the work to be done, the plough will exactly cut and turn the furrow-slice of the size that is desired, without leaving a *single inch* uncut, or unturned, that ought to be cut and turned. There is no swing-plough that ever was made will do this, unless where the horses are exceedingly well trained, and the ploughman a perfect master of his business, and constantly on his guard. We have seen ploughmen creep along at ploughing matches, in a manner that would be utterly unfit to be practised in ordinary ploughing upon a farm. Every ploughman should be able, in compe-

tition at ploughing matches, to stand up to his work, as it would be proper for him to do at home upon the farm. A man can do this with the wheel plough under every circumstance, where the land is free from stones and roots. So good an implement as this is does not require much recommendation or patronage to bring it into use, when it is once known. The mould-board and share are perfect in form, according to our idea, as any we have ever seen, and indeed the most perfect. The iron wheels might be substituted by wooden wheels if any danger of breaking them might be anticipated. We do not recommend the plough in opposition to any other plough, but simply on its own merits, as an implement that would be very suitable for use on a large portion of the lands in Lower Canada, and particularly for Canadian farmers accustomed to wheel ploughs. We are satisfied it will not supersede the swing plough with those who use them, whatever may be its merits, nor do we desire or wish it. The swing plough, for those who know how to use it properly, need not be changed for any other, but if wheel ploughs are to be made use of, and we see no objection to them, the Rutland wheel plough is capable of executing work as well as any plough we have ever seen in America, and according to our humble judgment there is none equal to it for lightness of draught, and for exactness in executing the work.

We have already noticed, "The Farmer's Guide to Scientific and Practical Agriculture, "by Henry Stephens author of the "Book of the Farm," &c., "assisted by John P. Norton—Professor of Scientific Agriculture in Yale College, New Haven, " now being published at New York, by "Leonard, Scott & Co. The 11th. number is now published, and the high character of the first numbers is fully sustained throughout the whole. It is to be had at Mr. Dawson, Place d'Armes. This work when complete, will be a very valuable addition to an Agricultural Library. There is no part of it

that we have seen, that may not be read with advantage, by farmers. However, it may be disputed by some parties, agricultural publications, are entitled to the merit of being the principal means of advancing the improvement of husbandry. It is by these publications that the experiments made by wealthy men and the results obtained from them, have been reported, for the instruction and encouragement of practical men. There are very few working farmers who have been first to introduce new and improved modes of cultivating crops, of breeding, rearing, or feeding stock, or the management of their products. There are many of these we rejoice to say, very willing to adopt suggestions proposed to them, but there are few who have originated the most valuable improvements we have. We have known parties to appropriate as their own, improvements which have only been suggested to them by published works on agriculture. This, to say the least of it, is most ungenerous. They might be content with profiting by the suggestions offered to them, and recommend the practice to others, but in justice to agricultural publications, they should give them the merit of the suggestions. It is this injustice that prevents agricultural works from having so wide a circulation as they deserve. You scarcely ever heard a working farmer acknowledge that he had even derived a useful idea from any work on agriculture, but all his improvements are his own and the suggestions of his own intellect.

Mr George Shepherd, the seedsman of the Lower Canada Agricultural Society, has just received from Europe a large supply of clover and other Agricultural seeds, of this year's growth, and of the best quality; which he will dispose of, as usual, on moderate terms. He also receives samples from farmers of any seeds they may have to dispose of, which may be seen at his store by parties desiring to purchase. In sending samples, it is requested that the variety be distinctly stated, and whether engaged to be unmixed. Also the quality of

seed, time of sowing and harvesting, and the produce per arpent of grain and straw—together with any other information that may be useful to Agriculturists. Mr. Shepherd has also on hands the very best steel spades, shovels, digging-forks and hoes, with many garden implements.

AGRICULTURAL REPORT FOR NOVEMBER.

The month of November was very fine, with scarcely any frost up to the 17th, when considerable rain and sleet fell, but on the 18th the weather again cleared up, and continued fine to the 21st, when we again had a light fall of snow that disappeared in the course of the day. Up to this time there was no interruption to ploughing, and we have seldom seen a more favorable Fall for completing the work of the farm. This cannot fail to be beneficial to farmers to have an opportunity to have their ploughing and drains in good order before the Winter commences. The working season is so short in Spring that it is a great advantage to have the soil ready for the seed the moment it can be sown. When the ploughing and draining is well executed in the Fall, the soil soon becomes in working order after the snow disappears in Spring. We were glad to hear from several parties that they had carted away the banks of open drains, and sloped them down, as we have so often recommended. This would be a most useful improvement in open drains, and make it quite an easy matter to keep them constantly in good order. We do not know an expenditure that would pay the farmer better than the carting away the sloping or all his drains. The drains will act much better when properly sloped than when cut perpendicularly, and will never require much labour to keep them clean. We had an opportunity this Fall to see a field thorough drained with tiles, by James Logan, Esq. The drains were over 3 feet deep, at 24 feet apart, and the work well executed, with the exception, that the bottom of the drains was wider than we thought necessary. We conceive it would be

better to have the bottom of the drains exactly the size of the tile, and that the tiles would be less subject to get out of their places; this would also save some excavation of the earth. Regular draining tools are necessary for this work, and we believe they are not to be had here unless when imported by those who want them. Mr. Logan has thorough drained another field some time ago, and has found it a great improvement. He told us the soil of this field immediately after rain is dry, and in a condition to be worked. This would be a great advantage in Canada. The expense of tiles may deter many from thorough draining, but we think wood or small stones might very well be substituted for tiles. We have, in former numbers of this Journal, described how stone drains are made, and also how they could be made with small poles. For a foot deep of the bottom of the drain it need not be more than 10 or 12 inches wide at height of the foot, and 5 inches wide at the bottom, and it is only necessary to fill this part with small stones, covering the stones with a sod of earth, with the grass side next the stone, and then filling in the upper part of the drain with the earth taken out. There is no doubt that the improvement of Agriculture in Lower Canada is progressing. When a few have commenced to improve their success will induce others to follow their example. The Agriculture of Eastern Canada may be in a backward state generally, but so is the Agriculture of every part of North America that we have ever seen. The result of this year's crop has been generally satisfactory in proportion to the cultivation of the soil. The season throughout, has been beautiful as we could have wished for. Wheat or potatoes have not suffered much by insects, or disease. The crop of wheat is not very heavy certainly, but the fly has not injured it much. It is extraordinary that the wheat-fly, *Cecidomyia Triticæ*, is not accurately described by writers in this country, nor indeed in England. It is called by some the *Hessian fly*, quite a distinct insect, that cuts the stalk of wheat near

the root, instead of eating the grain in the milky state in the ear, as the larva of the wheat-fly does, and fortunately the Hessian-fly is almost unknown in Lower Canada. The wheat-fly is also described as the wheat weevil, an insect that has never been known in a wheat field, and only injures wheat in the granary. It is injurious to Agriculture, that troublesome insects when attempted to be described should not be described accurately as it leads people into error respecting them. We hope that as Agricultural skill and improvement is more general we shall be able to subdue and overcome the depredations of insects and vermin that are injurious to the farmer. It is possible yet to execute work in the fields, and we have seen parties ploughing up to this date. We do not even now see any appearance of winter more than a month ago. The crows are still here in large numbers, that usually leave us the latter end of October. We have not seen them continue here so late during 33 winters past. We suppose it may indicate a mild winter, but we hope not so mild as to deprive us of ice on our rivers, and snow on our fields and roads. Domestic animals find considerable provender still in the fields. There is no certainty of the weather continuing fine for any length of time, but there is no indication of an immediate change. The mildness of the weather will save much provender for cattle, and firewood to the people, and this is an important consideration. We do not think there is any portion of British America can boast of a finer Fall than Lower Canada this year. The markets continue abundantly supplied with all descriptions of Agricultural products, which sell at moderate rates. We have never seen here better beef and mutton in the market. The Canadian farmers bring in most excellent mutton for sale. We saw, last week, a farmer from Varennes, having mutton which we considered too fat. This fact is encouraging—Canadian cheese of good quality is plenty in the market this year, and we rejoice at it. Fowls are in great abundance, some very fine,

all sell at moderate rates. A stranger visiting our market, whatever he might have heard of signs of ruin and decay, could never believe that there was any danger of our population being starved for want of abundance of excellent food. Although nature reposes in the country during the winter, this repose is not unnecessary, but, on the contrary, is highly useful for future vegetation, flowers and fruits. Our fields could not always be producing in this climate. The frost and snow of Winter is of great benefit to our ploughed soil, as a covering of snow is highly advantageous to our meadows and pastures. Lower Canada has advantages in this respect that she does not get full credit for, over all other parts of North America that we know anything of. We have always endeavoured to represent this country as she is entitled to be represented, and we have no sympathy with those who would speak or write against it. In addition to all other advantages, it is the most healthy country in America, we believe, and is not this blessing alone one of the greatest advantages we could possibly enjoy? Without health there is very little of true enjoyment to mankind, wherever his lot may be cast on this earth. Sunny climes and constant verdure cannot compensate the invalid for the want of health, that is frequently the consequence of a residence in these favoured climates.

November 26th, 1850.

THE FALLS OF NIAGARA.—We have frequently been told by parties who had visited those stupendous Falls, that their expectations had not been fully realized on first seeing them. We cannot conceive what their expectations may have been previous to visiting them, when on seeing them, they were disappointed. For our own part, although we had formed high expectations of the wonder and delight we must experience at the sight of a water fall of which we had heard and read so much, our highest expectations were more than realized, and we never before saw any work of nature

that interested us so much. We fortunately had an opportunity of seeing them in fine weather—at night during a full moon, and before, and at sunrise. From the low banks of the river below the Cataract, we had a view of the Falls by the light of a full moon, and perfectly clear atmosphere, and the sight was sublimely beautiful and grand, beyond anything we could have previously imagined. Indeed the attraction was so great, that we could scarcely persuade ourselves to leave it during the night, and when we did retire it was only to the Pavillion Hotel, immediately over the Falls, where we had a view of them from the windows, and heard the sound of the falling waters all night. At the dawn of morning we again took our station on the bank of the river. The weather was beautifully clear and calm, and before, and immediately after the rising of the sun, there was a dense mist, or steam over the waters, extending from the rapids above the Falls—to the Falls—and downwards to the Suspension Bridge. The best idea that can be formed of the appearance of this mist, is by imagining the rapids—the Falls—and the river below them, to be one vast boiling chauldron, producing this mist or steam. It is impossible to describe the beauty of the scene when the sun first appears above the horizon, shining through this mist or steam. Other parties perhaps might not estimate it so highly as we did but we certainly never witnessed any scene to equal it, and our only regret was its short duration, as, when the sun was half an hour high, the mist had nearly all disappeared, except immediately over the Horse-shoe Falls. We believe that under similar circumstances to these we have stated, a view of the Falls in the morning, before, and at sunrise, in the month of September will be more interestingly beautiful, than at any other time they can be seen. We noticed particularly, that there can be no mistake, as to the reported height of the Falls being fully equal to what they are stated to be; about 160 feet on the Canadian side. We also observed that the vast quantity of water

that finds its passage over the Falls from the immense Lakes of Upper Canada must be much greater than one would be likely to suppose from the width of the river below the Falls. The water is very rapid for nearly two miles above the Falls, and in passing over the horse-shoe Falls it does not flow in a regular stream as over the Falls on the American side, but it actually tumbles over in vast heaps or in great ridges or waves like those of the Ocean of great depth and size. Going under the protecting rocks, over which the waters falls, the noise is tremendous, and the view of the falling waters from this position is calculated to inspire the soul with awe and wonder. Immediately below the Falls, the waters are quite smooth, and there is a Ferry established between the Canadian and American shore. The Americans have also a small steamer, very appropriately named. "The Maid of the Mist" which takes passengers to view the Falls from these still waters, and she approaches them as near as she can. Any of the passengers who remain on deck, have to wear oilcloth cloaks, and hoods to throw off the spray, that is constantly falling. From the Ferry downwards, to Queenstown, the river is exceedingly rapid. The whirl-pool is about four miles below the Falls, and we suppose, is produced by a bend in the river. The rapid current when it comes to this bend, causes the whirlpools, and the constant and great agitation of the waters has formed quite a large Bay on the Canada side of the river. The agitation of the waters, at this bend or bay is tremendous and forms a number of whirl-pools, and pieces of wood, or any light substance, carried into this place are constantly turning round with the waters, and in fact the whole bay presents a most extraordinary appearance. We confess we should have been much gratified to see a boat or craft of some kind upon the waters in this Bay, to see what effect would be produced. It can be seen best from the Canada side, as you can look down upon the Bay. The whole seen, from the whirlpool, upwards

to where the rapids commences above the Falls, is, we suppose unequalled upon earth, and was our place of residence within a convenient distance, we should be tempted to devote more of our time to the contemplation of these mighty Falls than would be expedient for us. We had also an opportunity of seeing the burning well, situated about a mile above the Falls, on the Canada side. The water of this well ignites by applying a lighted match to it, and produces a flame like that from burning spirits of wine. We do not know anything of the chemical character, of the water, but it is perfectly clear, and has no ill taste. An American canal boat, has by some means, got into the rapids above the Falls, and now lies within a few yards of the edge of the Falls on the Canada side, and must be kept in its present position by rocks, that prevent her going over. Had she been even a few yards further from the Canada shore, nothing could prevent her going over the Falls, but she happens to be near the shore in the shallowest part of the water. There is another large rock, close to the place where the Table rock fell in lately, that will probably fall also, at no distant period. There is a large and deep fissure already between it and the banks, that is certain to extend. We were glad to see that no attempt has yet been made by man, on the Canada side to disfigure by artificial means this wonderful work of the Creator. The only thing that has been done on our side is the construction of a miserable stairs (from the upper to the lower bank of the river) that is quite broken and unsafe in many parts of it. We were surprised that the numerous visitors to the Falls, would not induce interested parties to construct such a means of access from the upper to the lower bank of the river, as would be suitable, safe, and in keeping with this greatest natural wonder of the world. Whatever may be done in this way, the work of man, in dressed wood, or stone and mortar, should be kept out of sight as much as possible from the view of the Falls—and we confess we should have been glad to see the tower on

Goat-Island tumble over the Falls provided that no life was lost by it, and that it was not to be replaced by another tower. We thought even the Canal boat a disfigurement to the Falls. It appeared a thing that had no business there. No work of man's hands can ever improve the appearance of the Falls of Niagara—in any part of it—from the Canada to the American side, and all disfigurements should be strictly prohibited by the inhabitants of both countries, whether for gain or whatever pretense. The Suspension Bridge situated about two miles below the Falls is not in sight from the Falls on the Canada side. It is a beautiful work of art, and highly creditable to its constructors. It is 800 feet in length, a single carriage-way, and in 220 feet above the water of the river. The agents very kindly allowed us to pass and re-pass, and would not accept any toll, and we beg to offer them thus publicly our best thanks—not for the remission of the toll, but for their civility to a stranger. We must not neglect to mention the museum of Mr. Barnett situated close to the Falls. He has a numerous and excellent collection of the natural productions of the country in every good preservation and arrangement. He has also some live wild animals, a male and female Buffalo, a wolf, perfectly tame, and some others. His Camera Obscura, is very interesting and we particularly admired his garden, arranged in such good taste for its peculiar situation. His place altogether is well deserving a visit. It may be considered rather inconsistent to occupy the pages of this Journal with a description of the Falls of Niagara that have been so often and so ably described by regular tourists. We only give a farmer's description of them, for the entertainment of farmers who may not have seen them, or read any particular description of them. The wonders and beauties of nature have always interested us deeply, and as the Falls of Niagara has interested us more than any thing we have ever seen before, we could not forego this opportunity to submit our humble description for those who

may not have seen them. It is rather a dull task to be forever confined to writing or reading on one subject, and we hope subscribers will not find fault with us for changing the subject in this instance. We find we have forgotten to state, that a carriage road has been cut from the Clifton Hotel down to the lowest shore of the river, at the Ferry, that answers the purpose extremely well at that point for gaining access to the lowest bank of the river.

We beg to thank a correspondent for the list about inserting in our January number, a list of the different District Agricultural Societies in Lower Canada, with the number of Members, and the amount of the Parliamentary Grant received by them, as the simplest way of shewing what interest is actually taken by the inhabitants in so wide a source of prosperity to the country. With a view to conveying out this idea, we should be glad to be timely informed by the Secretaries of local Associations what minor or *Branch* Societies have sprung from each district or present stock and are successfully co-operating therewith.—

We have much interest in reading the Report, published in the Mark Lane Express, of the County of Rutland great Ploughing match, which took place at Great Casterton near Stamford in that county, on the 8th of October last. Such a ploughing match would be worth looking at. We give a short extract of the proceedings, with a speech of the manufacturer of the Rutland wheel plough; Allen Ransome Esq., of Ipswich. Ploughing matches are calculated to produce much good, but there should be trials of the various ploughs in common use, and if possible, on various qualities of soil. Some ploughs that would be well adapted to light soil, might not be so suitable on heavy soil. While light soil might readily be ploughed with a light plough, and two horses of moderate size, it might require two larger sized horses, or perhaps more power, and a stronger plough, to plough heavy strong soil. There is generally

a trial on light and heavy soil in the Old Country at ploughing matches, and it should be so in Canada, if it was possible, to show in the most satisfactory manner, the best implements, and the necessary power of draught, on various qualities of soil. When a farmer sees a ploughing match on light and easy ploughed land, who knows that he has land of quite a different quality, requiring much greater animal power to plough it, he concludes that such ploughing matches are no example to him, and returns home with the conviction that he cannot make any alteration in his mode of ploughing, as a light plough and two moderate-sized horses, could not work his strong soil. Whatever may be done by County Agricultural Societies, if there should be a District or Provincial ploughing match, there should be a trial with all sorts of ploughs in general use, as they are generally used and on at least light soils, and heavy clay lands, and if farmers could not bring their ploughs, there should be means adopted to have the ploughs brought there and worked at the expense of the District or Provincial Societies. The best, and most suitable implements are of the greatest consequence to agriculturists, and to the country, and every means should be adopted to discover which are the best and most suitable ploughs in various situations and circumstances, where they may be employed. If one plough is better than another let it be fairly proved in open competition and not up on the interested recommendation of the party who recommends it. There is another circumstance of great importance, that implements should be easy to keep in good order, and that the farmers should not be subjected to high bills of tradesmen, for annual repairs, as they frequently are in Canada. In a late Report of an English Farm, of 740 acres of land, and more than 500 acres of it in tillage—28 work-horses kept, 12 ploughs, and a large number of carts, waggon, and other implements, the contract made with the blacksmith for several years past to keep up the whole establishment, was only £50 annually, and the far-

mer was to reduce it this year to £40. annually in consequence of the operation of Free Trade. But to return to the ploughing match. There was 8 classes to enter in, in the class open to all England, there was 49 entries. The following is an extract from the Report.

RUTLAND PLOUGHING MEETING.

It is 23 years since Mr. R. W. Baker, of Cottesmore, first turned his attention to the advantage of encouraging good ploughing in Rutland by means of annual competition; at that time there were very few good ploughmen; but as meeting followed meeting, the spirit of honorable rivalry increased, until at length the smallest county in England stood before the agricultural world as the most celebrated for its arable cultivation. Rutland ploughing having reached this point of pre-eminence, and Mr. Baker having arrived at the 20th year of his management, three years ago he relinquished his position, in the hope that what he had so well established might be continued by others; no one, however, seemed willing to take the responsibility of the meetings, and the annual competition ceased until the present year, when Mr. Baker again resolved to take the field, and the result has been the largest and most important series of ploughing matches ever known in this or any other country. The locality selected for the trial of industrial skill was Great Casterton and Ingthorpe (two miles from Stamford), on the farms of Mr. Edw. Roberts; and at eight o'clock on Tuesday the 8th inst., no less than 138 ploughs were simultaneously set to work. The scene was a most imposing one; and as the operations progressed, admiration was on all sides expressed at the extreme nicety with which the numerous competitors guided their shares, turning up ridges straight as a line, and forming furrows of such accurate dimensions that not the least difference of measurement was perceptible. The judges had a most difficult task to perform in selecting the best men, though in the end their decisions gave general satisfaction. The number of visitors to the fields in which the ploughing took place was immense, and the village of Casterton had not presented such a busy aspect for many years. Among the county gentry who attended the operation in the course of the morning were Gilbert Joln Heathcote, Esq., M.P., and some friends, Geo. Finch, Esq., and his daughter, the Hon. Gerard Jas. Noel, M.P., the Hon. Henry Noel, Stafford O'Brien, Esq., J.A. Ransome, Esq., of Ipswich, &c., &c. The judges were Mr. T. R. Cutbush, of Teston, Kent; Mr. Hawkins of Assingden Hall, Suffolk; Mr. Benj. Painter, of Carlton Curliou, Leicestershire; Mr. Harrison, of Bagworth Park, Leicestershire; Mr. Burbidge, of Wakerley; and Mr. Fowler, of Exton.

The ploughs used were chiefly manufactured by local makers, being Ransome's principles adapted to the soil and system of the county. The quantity to be ploughed by each candidate was half an acre of land, and the conditions were that the work should be done within four hours, the furrows not less than four inches deep, and horses abreast without a driver.

At the Dinner, amongst the toasts given, a Mr. Harmond proposed "The Plough Makers of England," and coupled with it the name of Mr. Allan Ransome of Ipswich.

Mr. RANSOME said it was to him a source of great pleasure, though not unattended with difficulty, to be able to join the company on the present occasion; for, when he looked back through the long vista of years during which he had occasionally been associated with his kind friend Mr. Baker, and with many of those now present whose heads had grown grey since he had known them—and when he found that the places of some of his early acquaintances had been supplied by younger men whom he had not before met—it was gratifying to find that the object of efforts of more than 20 years' continuance had been fully and successfully realized (cheers). He remembered the time when Rutland was behind the other Midland Counties in ploughing, and when he introduced ploughs which were the types of those now in use; and he congratulated the county on its efforts to carry to perfection this necessary employment. He heartily recognized as brother-workers those makers who had taken the Ransome plough as their model; and, far from looking upon them as competitors, he hailed with satisfaction the display of their ingenuity, and felt great pleasure in meeting them. He had no desire to lower the value of the improvements which had been made in some of the ploughs; but, as an implement-maker, he thought it right to warn them of this fact, and to acknowledge an error into which he had himself possibly fallen, that by a too high breeding as it were, by attempting to make the very best article for the species of competition they had that day witnessed, it did not necessarily follow that the plough best adapted for that purpose was the best description of plough for general purposes. (Hear.) It was important to look to that which would tend most to promote the pounds-shillings-and-pence value of cultivation, and not be led away by the applause which attended success on occasions like the present. Reverting to the principal object of the day, Mr. Ransome said it was pleasant to be able to congratulate the company on the increasing prosperity which attended their efforts in Rutland to promote the cause of good ploughing. He had for many years attended ploughing meetings, though for the last few seasons he had from necessity held himself excused; but, like a good hunter, at the sound of the horn he could not refuse to visit his friends in Rutland, upon re-

ceiving an intimation from Mr. Baker that their meetings were about to be revived. He knew of no instance on record where such a large number of ploughs had started, and so many had done such good work, as at Casterton. He had seen work that morning which he had never seen excelled, if equalled; and he questioned whether he should ever again see it equalled. Looking at the large number of competitors and the limited number of farmers in the county, he was convinced that Rutland had accomplished what no other county could do. Mr. Ransome concluded by offering £5 towards the funds for rewarding unsuccessful competitors at the next meeting; he remarked that he admired the plan of not allowing any man who had come forward in the honourable spirit of emulation to entirely lose the value of a day's work (cheers).

In the course of the evening a song was sung, which concluded with the following verse:—

"Britannia rules the waves, they say;
Well, that's a power no greater
Than ploughing as we've done to-day,
For she could rule no straighter.
But now I've done; and ere I close
Let's give the room a shaker,
For this is what I must propose—
Long life to Richard Baker."

We copy the following interesting Report of the proceeding of a meeting which lately took place in Wales. The example might be followed in Canada with great advantage to agriculture and to the general interest of the Province. We do not say that agricultural education can be provided here as in Wales by private support alone—but we do say it should be provided from some means.

Institution for the Education of Farmers's Sons.

Mr. SANDBACH,—Who had vacated the chair, then moved that it be taken by Sir. Watkin Williams Wynn, Bart., as president of a meeting originating in the recommendation of one, held at Denbigh on the subject of the education of farmers' sons, which was carried by acclamation. The proceedings of the committee were then read by Mr. Turnor, and

Mr. R. H. SANDBACH, in compliance with the request of the committee at the Denbigh meeting, came forward to move the first resolution. He said that the operations of the Agricultural Society had been much impeded by the want of education amongst the farmers of the district, and the members had at length been induced to take the necessary steps for the improvement of the rising generation of that class. They had several meetings, and after consultation with the gentry of the country, had determined to form an association in furtherance of their views. He did not propose to go into details,

but only to have a committee appointed to decide on any plan of operations which they might deem best; and he should move—"That although so much has been done of late years for education, no provision has been made for teaching those who are to be farmers the principles of the art they are to practise. That the times require all the skill and industry possible to be brought to bear upon the agriculture of the country. That an association be formed, to be called "The North Wales Association for promoting improved Education in the principles of Farming."

Mr. TURNOR said he had the honour and privilege to have been selected to second the resolution. As a farmer, and mixing much with farmers, he must say they were the worst educated class in the country. They could not avail themselves of the means of education enjoyed by the class below them, and the class above them rendering them no assistance they were retrograding in information. This was a very unsound state of society. It was a misfortune that those who paid the lower classes for their labour should be in a worse position than those whom they employed. As Welshmen, he must say that though their language was a beautiful one, they had but a limited literature, and could not have access, through their ignorance of the English language, to the scientific works and the records of important operations which are printed in that tongue. The population of the country was too numerous in proportion to the means of living in it; and if a portion of them had to emigrate and become labourers in another country, it was their duty to take care that they should have such an education as would qualify them for something else than being mere hewers of wood and drawers of water, and that they should carry away with them information that would be useful. He should be happy to give any assistance to the Society in his power.

The resolution was put and carried.

P. D. COOKE, Esq., in moving the second resolution, said it was a sad circumstance that a branch of industry of the greatest importance, one on which their very existence depended, was the last to be forwarded by education. Surely in these times it was necessary that they should take advantage of every invention and improvement, and all the information which could be obtained to enable them to compete with the foreigner. Agriculture certainly had not kept pace with civilization. In those countries where the arts flourished, agriculture was more behind than in other countries which were not so far advanced in civilization (Hear hear.) But he hoped that in this country they would all put their shoulders to the wheel, and lift their class out of their difficulties, without waiting for Wales. He moved that subscribers of £1 per annum be members of the Association, and eligible

to be on the managing committee; that an annual meeting of subscribers shall be held in the month of July or August to which shall be submitted a full report of the proceedings of the committee and which shall elect the committee for the ensuing year.

The object of this society, which is called the "Society for Improving the Education of the Children of Farmers and others in the rural districts of Denbighshire and Flintshire," will be better understood after the perusal of the following extract from the minutes of meetings of the provisional committee held at Mold and Denbigh:—

"To effect the important objects contemplated by this Society, it is proposed to engage the services of a competent person to visit such of the Free, Grammar, National, and other Schools, as shall be willing to co-operate in promoting the views of the Society, in order to introduce into such schools instruction in the principles of farming.

"In the Scotch schools, a similar plan is extensively acted upon with great advantage, and no attempt is made in them to teach the practice, but only the principles of farming.

"It is further proposed that examinations should be held in certain districts, and at stated periods, and prizes given to boys who shall have attained the greatest proficiency; and (if the funds should be adequate) that such prizes should consist of grants of money, to enable the pupils to complete their education at Chester, York, Cirencester, or at other superior schools."
—*Chester Courant*.

TRIAL OF SUB-SOIL PLOUGHS.—On last Tuesday, 12th instant: a trial was made of the comparative merits of a sub-soil Plough, manufactured by the firm of Rappelle & Co., of Rochester, in the State of New York, and one of English Manufacture, made by Read. The trial took place on the farm of J. B. Marks, Esq., near Barrield, Read's Plough is the property of Charles Penner, Esq., of Lachine, the one which was exhibited at the Provincial Show held in this city in 1849, on which occasion the first prize was awarded to one of the Rochester made ploughs. Read's plough carries the palm in England, as making by far the best work of all the sub-soil ploughs brought into competition with it there.

The undermentioned practical Agriculturists were present by invitation of Mr. Marks, to witness the trial, viz: Charles Penner, Esq., Dr. Young of the Garrison, W. Ferguson, Esq., W. Holditch, Esq., A. Cameron, Esq., W. Wilson, Esq., Thomas Briggs, Esq., Mr. W. Starks, Mr. A. Sandlaw, Mr. James Cowan, and Mr. John Dunn, who unanimously decided in favor of Mr. Penner's Plough, as being lighter of draft, easier to hold, and more thoroughly breaking up the soil, without bringing it too much towards the surface.

It is to be hoped some of our plough manufacturers will embrace the present opportunity of making application to Mr. Penner for this plough to take patterns by, and thereby supply their customers with the best article as yet known of this most valuable farm implement. The day was highly favorable, and no pains were spared to do every justice to investigations. The approved plough, while cutting to the depth of six inches under the bottom of the previously cut furrow, was drawn by one horse, and that a light one, while the other plough was drawn by four oxen part of the time, and part by a yoke of oxen and one horse in front.—*Kingston Argus*.

We find much satisfaction in giving insertion to a Report of a trial of sub-soil ploughs, which took place lately near Kingston. We have seen Mr. Penner's plough at work on his own farm at Lachine, immediately after he imported it, and we considered it the best sub-soil plough we had ever seen. This plough was awarded the first prize for sub-soil ploughs by the Royal English Agricultural Society, and it is sufficient proof of their correct appreciation of implements when it is compared with other sub-soil ploughs we have seen. We have often stated, and we now repeat it, that there are not on earth better Agricultural Implements than are manufactured, and in use, in England, and we never can adopt any better, or copy after any that are more complete. It may be possible certainly that we could make some of them more suitable for use in Canada, but we never can find better models to work upon. We have very frequently recommended Mr. Penner's sub-soil plough as the best pattern in America for any party who required such an implement.

THE DAIRY IN HOLSTEIN.

A great district of Continental Europe, that of Holstein, is celebrated for its dairies, and the butter they produce. These have been thus graphically described by an English gentleman, long settled there as a large farmer. In reading his interesting and instructive detail, the English reader must remember that the climate of Holstein is much colder in Winter and warmer in Summer than in our island, and that however large the dairies here described may be, yet still most of the good principles followed in them may be readily adopted in the smallest dairy.

The pride and boast of the Holsteiner, says Mr. J. Stanley Carr (*Jour. R. A. S.*, vol. i., p. 376

is his dairy; and the fame of Holstein butter, which, if we except that made in Holland Proper (or Zetland,) may well claim to be the best in the world, not only justifies his preference, but may render a sketch of those peculiarities of management, by which the Holstein dairy system is more especially distinguished, neither uninteresting nor useless to the English farmer. These may be chiefly classed under four heads, viz., the buildings and utensils; the time of milking, and the number of hands employed; the management of the milk; and the mode of working, salting, and packing the butter.

The buildings indispensable to a large dairy (which varies from 100 to 400 cows) are, a milk-cellar, a butter-cellar, a churning-house, (and closely adjoining, the horse-mill by which the operation of churning is invariably effected), a cheese-room, and a kitchen, in which not only the various utensils are washed, but the food cooked for all the persons immediately engaged in the dairy-work; to which must commonly be added their sleeping and eating apartments, as, on large estates, the whole of the establishment is usually kept apart from the mansion-house. The size and site of the milk-cellar are esteemed matters of first-rate importance: it ought to front the north; be shaded from the southern sun by the rows of trees—elder being especially selected for this purpose, and indeed placed if possible near the windows, on account of their influence in keeping off the insect tribes; and a thatched projecting roof is preferred, affording greater protection from the heat; while, in choosing the site, peculiar care is taken to place the dairy beyond the reach of everything calculated to generate bad odours, or in any way taint the atmosphere. The size of the milk-cellar must necessarily be regulated by the number of cows, but it should always be calculated to contain the produce of four milkings; and as the milk-dishes usually occupy a space of two feet square, the produce of 100 cows, giving on an average 8 quarts per day (a large average for the cows of this country throughout the year), would fill fifty milk-dishes at each milking, and would require a ground surface of 500 square feet, as the milk-dishes are invariably placed on the floor, the amount of each milking a little apart, and there must unavoidably be spaces left, to enable the dairy-maids to go through their various operations of skimming, sieving, and removing cream, &c. The floor, though sometimes flagged, is more generally of brick, neatly fitted, so that no water may lodge in the joints; and always gently inclined, with a grated opening at the lower end, to facilitate the mopping and washing of the floor, which is never omitted to be done twice a day, notwithstanding that every avoidable impurity is carefully guarded against, and every drop which may fall at the time of the milk being strained is instantly wiped up. A great improvement

has been recently made in some newly-arranged dairies, by dividing the floor into compartments with brick ledges, from three to four inches high, between which the milk-dishes stand; and the compartments (the lower extremity of which is fitted with a small sluice) being filled, by means of a pump, with cold water twice a day, the milk is preserved so cool as to prevent all approach to acidity for several hours longer than when placed on a dry floor; thus affording, even during the summer solstice, sufficient time for a complete separation of the milk and cream, without which the full proportion of butter cannot be obtained. For effecting the same desirable result, ice is frequently resorted to in sultry weather, either by dropping a piece of pure ice in each milk-pan, or by placing a pailful in the dairy, which, by giving off its cold, sensibly lowers the atmospheric temperature.

It is considered necessary that the milk-cellar should be sunk from 3 to 4 feet in the ground; be from 16 to 18 feet high (the best have an arched roof, as being more conducive to coolness than boards); and be furnished with two rows of windows, (and, if possible, on three sides, north, east, and west,) to secure a thorough air. The lower range consists of wooden trellis-work, provided inside with gauze frames to exclude insects, and outside with hanging shutters, which can be lowered and elevated at pleasure. The upper range is furnished with glass sashes when light only is requisite, which are exchanged for gauze frames, when more coolness is desirable. The butter-cellar also must be light, airy, and cool; being likewise sunk in the ground, and the same precautions adopted as in the milk-cellar, to secure an abundant current in pure air. In it the butter, when carried from the churning-house, is worked, salted and packed; and the filled butter-casks ranged on clean boards, somewhat elevated above the floor to admit a free passage of air, are weekly turned and wiped.

Next in order to come to the churning-house, it differs in no respect from similar arrangements in England, excepting that, of late years, the perpendicular movement of the churn-staff has been exchanged for the rotatory,* which is found to churn in a shorter time, and with less risk of producing, even in hot weather, what is called oiling.

The cheese-room is never admitted near either milk or butter-cellar, and is, in newly-arranged dairies, placed as far may be from them. In fact, as cleanliness forms the great object of the Holstein dairy system, the closest attention is paid to guard against every impurity, and to remove everything from the vicinity of the dairy which could, by possibility, exercise a sinister influence on the very susceptible substances of milk and butter; which suffer, to a degree those unaccus-

*Seventy-two revolutions per minute.

formed to observe it would little suspect, from a tainted atmosphere. As the preparation of cheese is better understood in England than here, I will only mention that three sorts are made—sweet milk, skimmed milk, and occasionally what is termed cream cheese; and shall now proceed to describe the management of the milk, first enumerating the number of hands required. These consist, in large dairies, of a master or overseer, a cooper, one or two cow-herds (as may be requisite), one or more swine-herds, an upper dairy-woman, and dairy-maids in the proportion of 1 to every 18 cows. The overseer's duty involves a general charge of the cattle, whether, in health or sickness, with a competent knowledge of their diseases and the remedies; he is responsible for the swine being properly cared for; that the calves, whether fattening or rearing for stock, are regularly and suitably fed; that the cow-herd does his duty; that the hours of milking are punctually adhered to; and that everything and every person is in proper place and keeping. He must further pay strict attention that the cows are milked thoroughly out, on which so very much depends; as not only the cow which is allowed to retain any portion of her milk diminishes her produce by so much from day to day, but the last being by far the richest part, a loss of butter is incurred, much more than proportionate to the quantity of milk, by this culpable negligence of laziness. According to the observations of an accurate examiner, Dr. Schubler, the first drawn milk contains only 5, the second 8, and the fifth 17 per cent. of cream! If the number of cows be not above a hundred, the overseer can also undertake the cooper work; which, when wooden milk-dishes are used, in addition to the cream-barrels, milking pails, and butter-casks required in the course of a year, is a consideration both of time and expense. But in large dairies, a cooper is kept in addition, who however must milk a certain number of cows, assist in carrying the milk, feeding the cows when housed, or any other dairy work which a man is capable of. The wages of these two persons vary according to the extent of the dairy, but may be averaged the first at 60, and the second at 40 dollars per annum.

The dairy-maids, besides milking, cleaning the vessels, &c., work in the garden in summer, spin in winter, and wash, bake, brew, and cook for their own establishment, under the superintendence of the upper dairy-woman, who is by far the most important personage in it, as on her skill, attention, and diligence depend, in great measure, both the quantity and quality, and, by consequence, the profit of the produce. She must not only thoroughly understand, but accurately observe, the moment when the milk should be creamed; the degree of acidity it must attain in the cream-barrels; its temperature, whether requiring the addition of warm or

cold water to the churn, as well as the all-important operations of kneading, beating, salting, and packing the butter. She must not only be punctiliously clean herself in person and work, but keep a strict eye over the cleanliness and order of her subordinate maidens. In very large dairies the upper woman has full employment, without milking, and needs the assistance always of one, and sometimes of two, of the more experienced dairy-maids, in butter and cheese making; but in smaller establishments she milks a certain number, generally 10 cows, while each of her subordinates have 18; her wages are usually 55 to 60, that of her chief assistants 22, and that of the others 18 dollars per annum.

THE NIGHT OF DEATH.

- "Life passes from me, mother—oh, so rapidly away;
 Ethereal voices speak to me—they will not let me stay;
 Oh! there are dark forebodings all entwined around my heart,
 And they tell me, dearest mother, that thou and I shall part.
- "Oh! let me see the sunshine, and the gay and glorious earth,
 With all its bright and beautiful just bidding into birth;
 They told me when the spring-time came with song of birds and flowers,
 That I should rally and revive amid its genial hours:
- "They told me—but it was not true—I feel its falsehood now,
 The signet of the shadowy land is set upon my brow.
 It is a long, long journey—I am going all alone;
 The pathway to the spirit world is distant and unknown.
- "Nay, mother, dearest mother; nay, I would not have thee weep—
 Oh! is it not a gentle thing to lay one down and sleep,
 Away from all the weariness, the sorrow, and the pain,
 Which make the fairest things of life so empty and so vain?
- "I would not have thee mourn for me, and grieve when I am gone,
 For when the star of life shall set, and hour of death come on,
 Thou'lt join me where, within those realms, those regions of the blest.
 'The wicked cease from troubling, and the weary are at rest.'
- "The shades are gathering o'er me fast—alas! I cannot see;
 Life's bark is tossed upon the waves of lone eternity;
 The waters rise around me, they engulf my waving breath—
 Oh! mother, take my hand in thine, this is the night of Death!"

EMILE VARNEDELL

RULES OF THE LEGISLATIVE ASSEMBLY, RESPECTING PRIVATE BILLS.

ADOPTED on 3rd August, 1850, and substituted for the Rules (numbered 60 to 72) heretofore in force.

60. That hereafter no Petition for any Private or local Bill will be received by the House, after the first fifteen days of each Session, unless the Petitioners shall have first applied, after notice thereof, for leave to present such Petition, and obtained permission of the House to do so.

61. That hereafter this House will not receive any Private or local Bills, except within the first four weeks each Session.

62. That this House will not receive any Report of a Standing or Special Committee, upon any Private or local Bill, except within the first six weeks of each Session.

63. That the Clerk of this House shall, immediately after the issuing of the Proclamation convoking the Provincial Parliament for the despatch of business, announce, in the *Canada Gazette*, and other newspapers published in this Province, until the opening of Parliament, the day on which the time limited for receiving Petitions for Private Bills will expire, according to the Rules of this House; and the said Clerk shall also announce, by notice set up in the Special Committee Rooms, and in the Lobby of this House, by the first day of every Session, the days on which, according to the Rules of this House, the time for receiving Petitions for Private Bills, Reports on those Petitions, and Reports on the Bills upon those Petitions, are to expire.

64. That all applications for Private or local Bills, whether for the erection of a Bridge, the making of a Rail Road, Turnpike Road, or Telegraph Line; the construction or improvement of a Harbour, Canal, Lock, Dam, or Slide, or other like work; the construction of works for supplying gas or water; or for the incorporation of any particular Profession or Trade, or of any Banking or other Commercial Company, or Cemetery Company; the Incorporation of a Town or City; the laying of any local Assessment; the division of any County or Township; the regulation of a Common; the survey of any Township, Acre, or Concession; or for granting to any individual or individuals any exclusive rights or privileges whatsoever, or for doing any matter or thing which in its operation would affect the rights or property of other parties; or for making any amendment of a like nature to any former Act, shall require the following notice to be published, viz.:

In *Upper Canada*—A notice inserted in one newspaper published in the County, or Union of Counties, affected.

In *Lower Canada*—A notice inserted in one newspaper in the English, and one newspaper in the French language, in the District affected (if any be published therein), and also affixed at the Church door of every Parish or Township that such application may affect, or in the most public place where there is no Church.

Such notices shall be continued in each case for a

period of at least two months, during the interval of time between the close of the next preceding Session, and the presentation of the Petition.

65. That before any Petition praying for leave to bring in a Private Bill for the erection of a Toll Bridge is presented to this House, the person or persons purposing to petition for such Bill shall, upon giving the notice prescribed by the 64th Rule, also, at the same time, and in the same manner, give a notice in writing, stating the rates which they intend to ask, the extent of the privilege, the height of the arches, the interval between the abutments or piers for the passage of rafts and vessels, and mentioning also whether they propose to erect a draw-bridge or not, and the dimensions of such draw-bridge.

66. That parties publishing notices of intended application for Private Bills under the 64th Rule, shall be required to send, addressed to "Private Bill Office, Legislative Assembly," (as soon as may be after its publication) a copy of the local newspaper containing the first insertion of any such notice (or a certificate of the insertion thereof, by the proprietor of such paper); and also, after the presentation of the Petition, a copy of the paper containing the last insertion of the said notice (or a certificate thereof), together with proof of notices having been affixed (when required) at the Church doors.

67. That every Private Bill shall be prepared by the parties applying for the same, and printed by the contractor for the Sessional Printing of the House, at the expense of the said parties, and one hundred and fifty copies thereof shall be deposited in the Private Bill Office, for the use of Members, before the second reading.

68. That Bills of a private nature shall be introduced on a Petition, to be presented by a Member, and seconded.

69. That when any Bill shall be brought into the House for confirming Letters Patent, a true copy of such Letters Patent shall be attached to the Bill.

70. That the expenses and costs attending on Private Bills giving any exclusive privilege or advantage, whether for the erection of a Bridge, or the construction of a Railroad, Turnpike Road, Telegraph Line, Harbour, Canal, Lock, Slide, Dam, or other like work; or for the incorporation of Banking or Commercial Companies, Cemetery Companies, or Companies for the construction of Gas or Water Works, or for any other objects or profit; or for amending, extending, or enlarging any former Acts in such manner as to confer additional powers, might not to fall on the public, and that for the purpose of defraying the same, the parties seeking to obtain any such Bill shall be required to pay into the hands of the Clerk of this House the sum of fifteen pounds, before, in any case, the said Bill shall be further proceeded upon after being read a second time.

71. That every Private Bill, after having been read a second time, shall be referred to the Standing Committee on Private Bills, if any such shall have been appointed, or to some other Standing Committee of the same character.

72. That whenever any Petition or Bill presented to the House shall have been referred to a Committee to examine the matter thereof, and report the same as it shall appear to them, to the House, the House will not admit any Petitioners to be heard, by

themselves or Counsel, against such Petition or Bill, until the matter shall have been first reported to the House.

That all persons whose interest or property may be affected by any Private Bill shall, when referred by the Committee, appear in person before them to give their consent, and if they cannot personally appear, they may send their consent in writing, which shall be proved before the Committee by one or more witnesses. And in every case the Committee upon any Bill for incorporating a Company, shall require proof that the persons whose names appear in the Bill as composing the said Company, are of full age, and that they are in a position to effect the objects contemplated by the Bill, and have personally consented to become so incorporated.

74. That no Committee on any Private Bill, based upon a Petition, notice of which is required by the 64th Rule, shall sit thereupon, without first causing a week's notice of the day of sitting to be set up in the Lobby.

75. That the Committee to whom any Private Bill shall have been referred, shall report the Bill to the House, whether such Committee shall or shall not have agreed to the Preamble, or gone through the several clauses, or any of them, and when any alteration shall have been made in the Preamble of the Bill, such alteration, together with the ground of making the same, shall be specially stated in the Report.

76. That when the Committee on any Private Bill shall report to the House that the Preamble of such Bill has not been proved to their satisfaction, they shall also state the grounds upon which they have arrived at such a decision.

77. That a filled up Bill containing the amendments proposed to be submitted to the Committee on the Bill, be deposited in the Private Bill Office, one clear day before the meeting of the Committee upon such Bill.

78. That the Chairman of the Committee shall sign, with his name at length, a printed copy of the Bill, on which the amendments are fairly written, and shall also sign with the initials of his name, the several amendments made and clauses added in Committee.

79. That no Private Bill be read a third time, until the party interested shall have delivered to the Clerk a certificate from the Queen's Printer, that the cost of printing one hundred and fifty copies of the Act for the Government, has been paid, or secured to him.

80. That (except in cases of urgent and pressing necessity,) no motion shall be made to dispense with any Sessional or Standing Order of the House, relative to Private Bills, without due notice thereof.

81. That a Book, to be called the "Private Bill Register," shall be kept in a room to be called the "Private Bill Office," in which Book shall be entered, by the Clerk appointed for the business of that Office, the name, description and place of residence, of the parties applying for the Bill, or their agent, and all the proceedings thereon, from the Petition to the passing of the Bill; such entry to specify briefly each proceeding in the House, or in any Committee to which the Bill or Petition may be referred, the day on which the Committee is appointed to sit, and the name of the Committee Clerk. Such Book to

be open to the public inspection daily, during Office hours.

81. That the Clerk of the Private Bill Office do prepare, daily, lists of all Private Bills, and Petitions for Private Bills, upon which any Committee is appointed to sit, specifying the time of meeting, and the room where the Committee shall sit; and the same shall be hung up in the Lobby.

MATTHEW MOODY,

MANUFACTURER OF

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JOSEPH PARADES.

Montreal, 1st December, 1850.

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